



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
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September 13, 2001

By Facsimile and Overnight Mail

(717) 231-4501

John P. Krill, Esq.  
Kirkpatrick & Lockhart  
240 North Third Street  
Harrisburg, PA 17101-1507

Re: Administrative Order Docket No. 2001-20  
Puente Valley Operable Unit, San Gabriel Valley Superfund Sites

Dear Mr. Krill:

Please find enclosed U.S. Environmental Protection Agency ("EPA"), Region IX, Administrative Order Docket No. 2001-20, issued to Carrier Corporation ("Carrier"). The Order takes effect on September 18, 2001 and requires Carrier to implement the shallow groundwater zone remedial action for the Puente Valley Operable Unit of the San Gabriel Valley Superfund Sites. Pursuant to Paragraph 58 of the Order, Carrier must provide written notice of its intent to comply with the Order by September 26, 2001.

You may reach me at (415) 744-1374 if you have any questions regarding this matter.

Sincerely,

Brett P. Moffatt  
Assistant Regional Counsel

Enclosures (Attachment 1 by mail only)

cc: Elizabeth Kroop, U.S. Department of Justice  
Arthur Heath, California Regional Water Quality Control Board - Los Angeles Region  
Jacalyn Spizman, California Department of Toxic Substance Control  
Ann Rushton, California Office of the Attorney General  
Carl M. Burnett, Industry Urban-Development Agency

75 Hawthorne Street  
San Francisco, California 94105

) U.S. EPA  
 ) Docket No.2001-20

## ADMINISTRATIVE ORDER FOR REMEDIAL DESIGN AND REMEDIAL ACTION

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#### ATTACHMENTS

Attachment 1 Puente Valley Operable Unit Interim Record of Decision

Attachment 2 Maps of 855 Anaheim-Puente Road, Industry, California

Attachment 3 Statement of Work for Administrative Order 2001-20

## **I. INTRODUCTION AND JURISDICTION**

1. This Order directs the Respondent, Carrier Corporation ("Carrier" or "Respondent") to perform the interim remedial design and remedial action for the shallow groundwater zone at the mouth of Puente Valley as described in the Interim Record of Decision ("ROD") for the Puente Valley Operable Unit of the San Gabriel Valley Superfund Sites, dated September 30, 1998. This Order is issued to Respondent by the United States Environmental Protection Agency ("EPA") under the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. § 9606(a). This authority was delegated to the Administrator of EPA on January 23, 1987, by Executive Order 12580 (52 Fed. Reg. 2926, January 29, 1987), and was further delegated to EPA Regional Administrators on September 13, 1987 by EPA Delegation No. 14-14-B. This authority was further delegated to the Director of the Superfund Division, EPA Region 9, by an Order dated September 29, 1997.

## **II. FINDINGS OF FACT**

### **Site Background**

2. In May of 1984, pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, EPA placed the San Gabriel Valley Superfund Sites, Areas 1-4 on the National Priorities List, set forth in 40 C.F.R. Part 300, Appendix B (49 Fed. Reg. 40320).
3. To study and undertake response activities at the San Gabriel Valley Superfund Sites, EPA divided the four San Gabriel Valley Sites into operable units, based on geography. This Order addresses a portion of the interim remedial design and remedial action for the Puente Valley Operable Unit ("PVOU" or "Site").
4. The PVOU is located in the southeastern portion of the San Gabriel Valley in Los Angeles County, California, and encompasses an area of groundwater contamination that is over twelve miles in length and from two to three miles in width. This area of contamination underlies most of the City of Industry and portions of La Puente and is depicted generally in the ROD (Attachment 1). Groundwater within the PVOU generally flows to the west and northwest, except that at the mouth of Puente Valley, the direction of groundwater flow ranges from west to north. Most of this groundwater is extracted by water supply wells at the northwest end of the PVOU. Some of the PVOU groundwater bypasses the water supply wells and flows towards the Whittier Narrows.
5. The San Gabriel Valley groundwater basin, including groundwater from the PVOU, provides drinking water to more than one million residents of the San Gabriel Valley and other nearby areas. The rights to extract and use this groundwater have been adjudicated by the State. Only specified users, including a number of domestic water purveyors, are permitted to extract groundwater from the Site. Given the absence of dependable alternatives to the aquifer as the region's primary water supply, the groundwater is expected to remain the residents' primary source of drinking water indefinitely.

6. The State of California considers all subsurface groundwater zones (shallow, intermediate, and deep) of relatively high permeability in the PVOU to be potential sources of drinking water.
7. The EPA, the State of California, and local water producers have detected chemicals of potential concern in the PVOU groundwater, including tetrachloroethylene ("PCE"), trichloroethylene ("TCE"), 1,1,1-trichloroethylene ("1,1,1-TCA"), their degradation products, and the other volatile organic compounds ("VOCs") listed in Table 1 of the ROD. These chemicals were used at many industrial facilities in and around the City of Industry beginning in the 1950s for degreasing metal parts and other purposes. Investigations of the source facilities indicates that these chemicals were released to the ground through on-site disposal, careless handling, leaking tanks, pipes and sumps, and other means. Within the San Gabriel Valley Superfund Sites, more than one-quarter of the approximately 366 water supply wells have been found to be contaminated with one or more of these chemicals.
8. Fifty-four VOCs have been detected in the groundwater drawn from production and monitoring wells in the PVOU. (See Table 1 in Attachment 1). At least five of these VOCs are classified as known or probable human carcinogens. If groundwater contamination is not addressed, there will be a long-term potential for human exposure to VOCs. The human populations potentially exposed to VOCs present in the groundwater include individuals using the groundwater for domestic purposes.

#### EPA's Site Activities

9. Beginning in March 1991, EPA sent general notice letters to those entities that EPA believed to be potentially responsible for contamination at the Site. In May 1993, acting pursuant to Section 122(e) of CERCLA, 42 U.S.C. § 9622(e), EPA sent special notice letters to 58 potentially responsible parties for the Site. The special notice letters requested that the recipients enter into negotiations with EPA to perform the Remedial Investigation and Feasibility Study ("RI/FS") for the PVOU. Forty-two of the potentially responsible parties, including Respondent, formed the Puente Valley Steering Committee ("PVSC") and in September 1993 entered into an Administrative Order on Consent to perform the RI/FS.
10. From September 1993 to May 1997, the PVSC undertook the RI/FS for the PVOU. Because of the PVSC's failure to adequately address EPA comments on RI/FS deliverables, EPA took over the Feasibility Study in December 1996. In two separate reports dated May 30, 1997, the PVSC presented the results of the Remedial Investigation, and EPA presented the results of the Feasibility Study, in accordance with CERCLA and the National Contingency Plan, 40 C.F.R. Part 300.
11. Pursuant to Section 117 of CERCLA, 42 U.S.C. § 9617, EPA published notice of the completion of the Feasibility Study and the proposed plan for remedial action on January 28, 1998, and provided opportunity for public comment on the proposed interim remedial action.

12. The decision by EPA on the interim remedial action to be implemented at the PVOU is embodied in the ROD, executed on September 30, 1998, on which the State of California has given its concurrence. The ROD is Attachment 1 to this Order and is incorporated by reference. The ROD is supported by an administrative record that contains the documents and information upon which EPA based the selection of the response action.

### Respondent's Past Operations and Evidence of Releases

#### Operations and Documented Releases

13. Respondent, doing business under the names Carrier Corp., BDP Company, and others, operated a manufacturing facility within the Site, namely, a 70-acre parcel located at 855 Anaheim-Puente Road, in the City of Industry, California (the "Facility" or "Property") from September 1957 to 1992. Respondent also owned the Property from 1957 to 1997. BDP Company is a division of Carrier Corporation, which in turn is a wholly-owned subsidiary of United Technologies Corporation. Respondent manufactured air conditioning and heating equipment and used PCE, TCE, and 1,1,1-TCA for degreasing metal parts. At the Property, Respondent operated several vapor degreasers, an industrial waste sewage line, a clarifier, a hazardous material/waste storage area, two aboveground storage tank ("AST") farms, and several sumps, some of which leaked, overflowed or otherwise discharged VOCs to subsurface soils and groundwater.
14. Respondent has produced records of its PCE and 1,1,1-TCA usage, showing that from 1972 through 1983 Respondent purchased an average of 40,000 gallons of PCE per year, and at times purchased as much as 73,000 gallons of PCE in a year. These records show that from 1980 through 1983, Respondent purchased between 500 and 10,000 gallons per year of 1,1,1-TCA. Respondent has also produced records documenting its off-site hazardous waste disposal shipments since December 1964. These disposal records show little off-site disposal of used PCE and 1,1,1-TCA, none of which occurred prior to 1975. According to these records, Respondent made two small off-site shipments of unidentified solvents in 1975 and 1976, and engaged in more frequent off-site disposal of used PCE beginning in January 1978. These records show that from 1978 through 1993, small quantities of used PCE were disposed of off-site from two to six times per year. In a 1984 letter to EPA, Respondent claimed that its used PCE and 1,1,1-TCA was not disposed off-site because most of it was "lost to evaporation."
15. From 1979 to approximately 1988 Respondent operated a four-stage conveyor degreaser with an approximate total capacity of 5,906 gallons of PCE. Prior to 1984, PCE and 1,1,1-TCA were stored in approximately five ASTs located near the vapor degreasers. After 1984, new chlorinated solvent was stored in a bermed area located outside the western side of the building in two ASTs.
16. On April 29, 1985, Respondent notified the Los Angeles Regional Water Quality Control Board ("LARWQCB") that a few days earlier it had discovered that a PCE release occurred to the subsurface soil from a steel-lined sump on the Property. Respondent has stated that

the sump was installed in 1979 and that the release occurred because a design defect in an associated large conveyor degreaser allowed PCE to flow into the sump, causing corrosion of the sump. Respondent has further stated that based on a review of its inventory and usage records, it estimated that the release from the sump began in November 1984 and ran through April 1985. Respondent initially estimated that the amount of PCE released from the sump to subsurface soils and groundwater at 15,000 to 20,000 gallons. Respondent later revised its estimate of the released to 8,000 to 20,000 gallons of PCE. Respondent did not implement detailed inventory control procedures for PCE until after discovery of this release.

17. Pursuant to the requirements of the LARWQCB, Respondent investigated soil matrix, soil gas and groundwater conditions at fifteen areas on the Property for evidence of VOC releases. These areas are listed below, and shown on Attachment 2:

- Northwest corner and former hazardous materials/waste storage area
- Former steam cleaning facility
- Former industrial waste water treatment plant
- Former aboveground PCE tanks
- On-site industrial sewer/interior drains and sumps
- Former Freon vapor degreaser
- Former sump degreaser
- Former thinner UST area
- Former spray paint booth area
- Former large conveyor degreaser and steel-lined sump area
- Former PCE tank area
- Former 5-stage washer
- Railroad spur area
- Former small conveyor degreaser
- Above ground vapor degreaser

18. Sampling at the Property has detected PCE, TCE, 1,1,1-TCA, and other chemicals of concern listed in Table 1 of the ROD, in the soil gas, soil matrix, and groundwater. An environmental assessment of the Property identified five significant sources of VOC releases to the environment: the large conveyor degreaser and steel-lined sump, the small conveyor degreasers, the five-stage washer, the spray paint booth, and the above ground vapor degreaser. These investigations demonstrate that, in addition to the 1984-85 catastrophic release from the steel-lined sump, a number of earlier VOC releases from the Facility have impacted subsurface soils and groundwater at the Site.

19. Respondent submitted a preliminary site assessment report on October 29, 1985, which described soil contamination, including PCE, TCE, 1,1,1-TCA, and 1,1,2-trichloroethane, and groundwater contamination, including PCE, TCE, 1,1,1-TCA, 1,1-dichloroethene ("1,1-DCE") and trans-1,2-dichloroethene ("trans-1,2-DCE"). The chemicals 1,1-DCE and trans-1,2-DCE often occur in the environment as degradation products of PCE, TCE and/or 1,1,1-TCA. TCE is also a common degradation product of PCE.

#### Soil Matrix and Soil Gas Investigations

20. During May 1985, Respondent's contractor collected soil matrix samples from five soil borings drilled to a maximum depth of 35' below ground surface ("bgs") in the former large conveyor degreaser and sump area. Laboratory analysis of these soil matrix samples detected up to 4,800 mg/kg of PCE at 4' bgs, 350 mg/kg of PCE at 15' bgs, and 400 mg/kg of PCE at 24' bgs. Respondent also installed five groundwater monitoring wells.
21. Between August 19 and 20, 1985, Respondent's contractor collected soil matrix samples from five soil borings drilled to a maximum depth of 40' bgs in the former large conveyor degreaser and sump area. Laboratory analysis of these samples detected up to 700 µg/kg of PCE at 5' bgs.
22. From November 14 to December 30, 1985, Respondent's contractor collected soil matrix samples from ten soil borings drilled to a maximum depth of 118' bgs in the former large conveyor degreaser and sump area. Seven groundwater monitoring wells were installed, including two deep wells. Laboratory analysis of these samples detected maximum VOCs concentrations of 5,600 µg/kg of PCE at 5' bgs and 410 µg/kg of TCE at 24.5' bgs.
23. From March 31 to May 2, 1986, Respondent's contractor collected soil matrix samples from one soil boring drilled off-site to a maximum depth of 48' bgs. Seven groundwater monitoring wells were installed. Laboratory analysis of these samples detected up to 35 µg/kg of PCE at 12' bgs. One groundwater extraction well and five monitoring wells were installed from May 27 to June 5, 1986. During August 1986, soil matrix samples were collected from thirteen soil borings drilled in several areas of concern. Two groundwater extraction wells and three monitoring wells were installed. Laboratory analysis of these samples detected up to 1,300 mg/kg of PCE at 4.5' bgs.
24. Between April 1986 and January 1987, Respondent's contractor collected soil matrix samples from ten soil borings drilled in the former large conveyor degreaser and sump area, and other areas of concern. Five groundwater extraction wells and one monitoring well were installed. Laboratory analysis of these samples detected up to 12,000 mg/kg of PCE at 15' bgs. Pure PCE was also encountered in groundwater extraction well EW-3.
25. During June 1990, Respondent's contractor collected soil matrix samples from six soil borings drilled in areas of concern. Laboratory analysis of these samples detected up to 7.7 mg/kg of PCE at 14.9' bgs. Between September 9 and 10, 1993, soil matrix samples were collected from seven soil borings drilled in the former freon vapor degreaser, and

- former sump degreaser. Laboratory analysis of these samples detected up to 5,300 µg/kg of PCE at 5' bgs, 110 µg/kg of TCE at 5' bgs, 130 µg/kg of c-1,2-DCE at 5' bgs, and 280 µg/kg of 1,1,2-TCA at 5' bgs.
26. On October 1, 1993, Respondent's contractor collected soil matrix samples from ten soil borings drilled in the northwest corner and former hazardous materials/waste storage area, and the railroad spur area. Laboratory analysis of these samples detected up to 1,590 mg/kg of PCE at 1' bgs, 1,590 mg/kg of PCE at 1' bgs, 2.89 mg/kg of c-1,2-DCE at 15' bgs, and 2.1 mg/kg of TCE at 1' bgs.
  27. Between March 17 and 19, 1993, Respondent's contractor conducted a soil gas investigation in the northwest corner and former hazardous materials/waste storage area which detected maximum VOC concentrations of 2,790 ug/l of PCE and 12' bgs, 123 ug/l of TCE at 9' bgs, and 102 ug/l of 1,1-DCE at 9' bgs. Respondent's contractor collected additional soil gas samples from this area between September 23 and 24, 1993. Laboratory analysis of these samples detected maximum VOC concentrations of 1,124 ug/l of PCE at 4' bgs, and 54.3 ug/l of TCE at 5' bgs.
  28. During June 1993, Respondent's contractor collected additional soil gas samples from the former steam cleaning facility, former industrial waste water treatment plant, former aboveground PCE tanks, on-site industrial sewer/interior drains and sumps, former Freon vapor degreaser, and former sump degreaser. Laboratory analysis of these samples detected maximum VOC concentrations of 1,800 ug/l of PCE at 5' bgs, 870 ug/l of TCE at 5' bgs, and 460 ug/l of 1,1,1-TCA at 5' bgs.
  29. Between November 16 and 18, 1993, Respondent's contractor collected soil matrix samples from nine (9) soil borings drilled in northwest corner and former hazardous materials/waste storage area. Laboratory analysis of these samples detected up to 5.5 mg/kg of PCE at 5' bgs.
  30. Between October 3 and 5, 1994, Respondent's contractor collected soil matrix samples from seven (7) soil borings drilled in the former aboveground PCE tanks area, former thinner UST area, and former PCE AST area located in the loading dock area. Laboratory analysis of these samples detected up to 2,000 µg/kg of PCE at 5' bgs and 220 µg/kg of c-1,2-DCE at 10' bgs. The highest VOCs concentrations were detected in the northwest corner and former hazardous materials/waste storage area, the on-site industrial sewer/interior drains and sumps area, the former freon vapor degreaser, the former sump degreaser, the former large conveyor degreaser and sump area, and former PCE tank area located in the loading dock area. These findings indicate impact to the vadose zone from ground surface to the water table from on-site VOCs sources.
  31. Between October 3 and 5, 1994, Respondent's contractor collected soil gas samples in the on-site industrial sewer/interior drains and sumps area, the former freon vapor degreaser area, former spray paint booth area, former large conveyor degreaser and sump area,

former five-stage washer, and railroad spur area. Laboratory analysis of soil gas samples detected maximum VOCs concentrations of 2,900 µg/l of PCE at 5' bgs and 29 µg/l of TCE at 5' bgs.

32. During January 1995, Respondent's contractor performed a soil gas investigation in the former spray paint booth area, the former large conveyor degreaser and sump area, former PCE tank area, and the former five-stage washer area of the subject site. Laboratory analysis of soil gas samples detected maximum VOCs concentrations of 1,300 µg/l of PCE at 5' bgs, 130 µg/l of c-1,2-DCE at 5' bgs, and 34 µg/l of TCE at 5' bgs.
33. Between March 16 and 17, 1995, Respondent's contractor performed a soil gas investigation in the northwest corner and former hazardous materials/waste storage area. Laboratory analysis of soil gas samples detected maximum VOCs concentrations of 11,000 µg/l of PCE at 18' bgs, 520 µg/l of TCE at 5' bgs, 630 µg/l of c-1,2-DCE at 18' bgs, and 140 µg/l of 1,1-DCE at 18' bgs.

#### Groundwater Investigations

34. Between May 1985 and August 1988, Respondent's contractor installed seventy-six (76) shallow groundwater monitoring wells, fifteen shallow temporary groundwater testing points, and twenty shallow groundwater extraction wells. Initially, during May 1985, Respondent collected groundwater samples from five monitoring wells. Laboratory analysis of these groundwater samples detected up to 120,000 µg/l of PCE at monitoring well MW-1. Historically, the highest VOCs concentrations were detected in a groundwater sample collected from MW-2 during April 1987. Up to 290,000 µg/l of PCE was detected. These results indicate impact to groundwater quality from on-site. In addition, the groundwater VOC plume generated on-site has migrated off-site.
35. Subsequent groundwater investigations on and around the Facility consistently detected high concentrations of VOCs. PCE concentrations ranged from 62,000 µg/l in the first quarter of 1989 to 2,730 µg/l in the first quarter of 1997. Analysis of groundwater samples collected in March 1997, detected maximum VOC concentrations of 857 µg/l of PCE at MW-12, 59.6 µg/l of TCE at MW-13, and 962 µg/l of 1,2-DCE at MW-11. The highest VOCs concentrations were detected underneath and downgradient from the former large conveyor degreaser and sump area and near the loading dock. Depth to groundwater varied between 17.91' and 28.58' bgs and groundwater flow direction was towards the northwest.
36. Analysis of groundwater samples collected during the latest sampling event, March 2001, detected maximum VOC concentrations of 2,200 ug/l of PCE at EW-03, 44 ug/l of TCE at MW-30, 140 ug/l of 1,2-DCE at MW-12. All wells sampled across Respondent's property, contained PCE in average concentrations of 176 ug/l, demonstrating the persistence of PCE and the potential presence of a Dense Non-Aqueous Phase Liquid source of PCE in the groundwater. These data indicate that dissolved phase contamination from the Facility will likely continue to impact groundwater in the shallow and intermediate zones at the Site for many years into the future.

37. Soils underlying the Facility and the Site are fluvial sediments consisting of gravel, sand, silt and clay. Soil borings indicate that clay layers are present at various locations throughout the Site and in the vicinity of the Facility, however, the evidence does not support Respondent's position that the clay layers present an impervious barrier to migration of contamination from the Facility. Evidence demonstrating that soils underlying and downgradient from the Facility are discontinuous, permeable, and conducive to contaminant transport, includes: (1) lithologic logs from Respondent's monitoring wells showing discontinuous clays and permeable sandy zones; (2) Respondent's pump test data demonstrating a hydraulic connection between several sandy zones within the top 100' of soils; (3) a comparison of water quality data in wells upgradient and downgradient of the Facility's source areas demonstrating an increase in contaminant concentrations as groundwater at all monitored depths passed underneath the Facility; (4) the presence of the unused "Bixby" well downgradient from Respondent's releases which may have been a conduit for downward contaminant migration.
38. The above sampling results and other data collected at the Site indicate severe impact to groundwater quality from Facility releases. These investigations have shown that Respondent's contamination has also migrated off of the Property.
39. In response to the catastrophic release of 1984-85, the LARWQCB on March 7, 1986 ordered Respondent to investigate the release and design and implement a groundwater extraction and treatment system to capture PCE released from the steel-lined sump. Respondent developed and implemented a Remedial Action Plan and began operating two extraction wells and a groundwater treatment facility immediately downgradient from the Property. Subsequent groundwater investigations found that substantial quantities of PCE had moved downgradient of this extraction system.
40. On March 28, 1988, the LARWQCB ordered Respondent to design and implement additional groundwater extraction wells further downgradient from the Property. In early 1988, Respondent began operating seven extraction wells downgradient from the source of the catastrophic release. These extraction wells are located in a straight line parallel to the flow of the contaminated groundwater, and are not believed to have captured all contamination from the catastrophic release.

#### Impact of the Releases

41. Hazardous substances released from Respondent's facility have migrated through the soil, contaminating groundwater beneath Respondent's facility. These hazardous substances have generally migrated westward and northward from Respondent's facilities towards the mouth of Puente Valley, and have commingled with hazardous substances from other facilities, creating a large plume of contaminated groundwater. Evidence of downward migration through the soil includes the many soil vapor and soil matrix samples collected beneath Respondent's facilities demonstrating the presence of PCE, 1,1,1-TCA, and other hazardous substances originating from Respondent's facility, and geologic investigations which have documented the highly permeable nature of the subsurface soils. Evidence of migration through the aquifer includes the presence of chemicals in samples collected from

a network of monitoring wells installed in the PVOU downgradient of Respondent's facilities; the elapsed time of at least 30-40 years since hazardous substances were first handled at Respondent's facilities; and computer simulations of groundwater flow and particle movement indicating that contamination originating at Respondent's facility has migrated through the PVOU.

42. The groundwater contamination from Respondent's Facility and other sources in the PVOU has made it necessary for local water producers to install and operate wellhead treatment systems at public water supply wells at the Site. The affected water producers include the Rowland Water District, the San Gabriel Valley Water Company ("SGVWC") and Suburban Water Systems. The SGVWC has detected contaminants in its B7 well field. Suburban Water Systems' wells near Respondent's Facility have also been contaminated. This groundwater contamination threatens additional public water supply wells at the mouth of Puente Valley, and other presently uncontaminated sources of drinking water in and around the Site.
43. Four private wells located in the vicinity of Respondent's property were sampled during the Phase II Site Assessment. Three of these wells were large capacity municipal supply wells that are currently inactive, but not abandoned. These wells are located less than two miles downgradient of Respondent's property and are owned by Suburban Water Systems, a water purveyor. These wells have shown concentrations of PCE ranging from 2 to 58 ug/l. An open irrigation well, known as the "Bixby Well" was also sampled. The "Bixby Well" is located downgradient of the Respondent's property and is owned by Rowland Water District. Analysis of groundwater samples collected from the "Bixby Well" found PCE concentrations as high as 1,300 ug/l at a depth of 100' bgs. This well is located in the area of PCE contamination in the shallow aquifer and is perforated over shallow and deeper intervals. The "Bixby" well was cited by Respondent as a conduit for deeper groundwater contamination, and was grouted and sealed by the Respondent.
44. The selected interim remedy, as embodied in the ROD, calls for containment of the contaminated groundwater in the shallow and intermediate depths to its current lateral and vertical extent and the continued monitoring of the groundwater at all depths (i.e., shallow, intermediate and deep). The objectives of the selected remedy are to contain and limit the movement of contaminated groundwater into clean or less contaminated areas and depths; remove significant mass of contamination from the groundwater; and provide the data necessary to determine, in a subsequent final Record of Decision, cleanup standards for the Site. These objectives are reflected in the ROD's Performance Criteria which are the principal requirements governing the design, implementation and evaluation of the interim remedial action. The selected interim remedy allows for the use of existing groundwater extraction wells, treatment and conveyance facilities, where feasible and appropriate, to meet the Performance Criteria.
45. The interim remedial action will reduce exposure to the contaminated groundwater by limiting the spread of the contamination into less contaminated and uncontaminated portions of the aquifer, and by reducing contaminant concentrations in the aquifer.

### III. CONCLUSIONS OF LAW AND DETERMINATIONS

46. The Puente Valley Operable Unit is a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9). The PVOU also contains "facilities" as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9), including the Facility formerly owned and operated by Respondent.
47. The substances referenced in Paragraphs 7-8 found at the Site, and in connection with Respondent's Property, are "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).
48. These hazardous substances have been disposed of at the Site and have released and/or threaten to be released into the soil and groundwater, and have migrated and/or threaten to migrate from the Site.
49. Respondent is a "person" as defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).
50. Respondent is a liable party as defined in Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), and is subject to this Order under Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).
51. The past disposal and subsequent migration of hazardous substances at the Property and within the Site constitutes a "release" as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).
52. The potential for future migration of hazardous substances from the Site poses a threat of a "release" as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).
53. The release or threat of release of one or more hazardous substances from the Facility may present an imminent and substantial endangerment to the public health or welfare or the environment under Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).
54. The contamination and endangerment at the Site constitutes an indivisible injury. The actions required by this Order are necessary to protect the public health or welfare or the environment. Respondent is jointly and severally responsible for all of the contamination at the Site.

### IV. NOTICE TO THE STATE

55. On August 23, 2001, prior to issuing this Order, EPA notified the State of California Department of Toxic Substances Control that EPA would be issuing this Order.

## V. ORDER

56. Based on the foregoing, Respondent is hereby ordered to comply with the following provisions, including but not limited to all attachments to this Order, all documents incorporated by reference into this Order, and all schedules and deadlines in this Order, attached to this Order, or incorporated by reference into this Order:

## VI. DEFINITIONS

57. Unless otherwise expressly provided herein, terms used in this Order which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in the statute or its implementing regulations. Whenever terms listed below are used in this Order, or in the documents attached to this Order, or incorporated by reference into this Order, the following definitions shall apply:
- A. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601 *et seq.*
  - B. "Day" shall mean a calendar day unless expressly stated to be a working day. "Working day" shall mean a day other than a Saturday, Sunday, or Federal holiday. In computing any period of time under this Order, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the end of the next working day.
  - C. "EPA" shall mean the United States Environmental Protection Agency.
  - D. "DTSC" shall mean the California Department of Toxic Substances Control and any successor departments or agencies of DTSC.
  - E. "Hazardous Substance Superfund" or "Fund" shall mean the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.
  - F. "LARWQCB" shall mean the Los Angeles Regional Water Quality Control Board and any successor boards, departments, or agencies of LARWQCB.
  - G. "National Contingency Plan" or "NCP" shall mean the National Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, including any amendments thereto.
  - H. "Operation and Maintenance" or "O&M" shall mean all activities required under the Compliance Monitoring Plan and the Operation and Maintenance Manual developed by Respondent pursuant to this Order and Section IV of the Statement of Work ("SOW"), and approved by EPA.
  - I. "Paragraph" shall mean a portion of this Order identified by an arabic numeral.

- J. "Performance Criteria" shall mean those cleanup standards, standards of control, and other substantive requirements, criteria or limitations, identified in the SOW and the ROD, that the Remedial Action and Work required by this Order must attain and maintain.
- K. "PVOU" or "Site" shall mean the Puente Valley Operable Unit of the San Gabriel Valley Superfund Sites, Areas 1-4, in and near the cities of Industry and La Puente in Los Angeles County, California, and depicted generally in the ROD (Attachment 1).
- L. "Record of Decision" or "ROD" shall mean the EPA Record of Decision relating to the PVOU, signed on September 30, 1998, by the Regional Administrator, EPA Region 9, or her delegate, and all attachments thereto.
- M. "Remedial Action" or "RA" shall mean those activities, except for Operation and Maintenance, to be undertaken by Respondent to implement the final plans and specifications submitted by Respondent pursuant to the Remedial Design/Remedial Action Work Plan ("RD/RA Work Plan") approved by EPA, including any additional activities required under Sections X, XI, XII, XIII, and XIV of this Order.
- N. "Remedial Design" or "RD" shall mean those activities to be undertaken by Respondent to develop the final plans and specifications for the Remedial Action pursuant to the Remedial Design/Remedial Action Work Plan.
- O. "Remedial Design/Remedial Action Work Plan" or "RD/RA Work Plan" shall mean the work plan setting forth the Work to be performed by Respondent under this Order, as more fully described in Section IX of this Order and in the SOW.
- P. "Response Costs" shall mean all costs, including direct costs, indirect costs, and accrued interest incurred and to be incurred by the United States to perform or support response actions at the PVOU, and all basin-wide/non-operable unit specific costs that the United States has incurred and will incur in connection with the San Gabriel Valley Superfund Sites, Areas 1-4, which are attributable to the PVOU. Response costs include but are not limited to the costs of overseeing the Work, such as the costs of reviewing or developing plans, reports and other items pursuant to this Order and costs associated with verifying the Work.
- Q. "Statement of Work" or "SOW" shall mean the statement of work for implementation of the Remedial Design, Remedial Action, and Operation and Maintenance at the PVOU, that is set forth in Attachment 3 to this Order. The Statement of Work is incorporated into this Order and is an enforceable part of this Order.
- R. "Section" shall mean a portion of this Order identified by a roman numeral and which includes one or more paragraphs.

- S. "State" shall mean the State of California, including but not limited to the California Department of Toxic Substances, the California Regional Water Quality Control Board, and the California Department of Health Services, Drinking Water Field Operations Branch.
- T. "United States" shall mean the United States of America.
- U. "Work" shall mean all activities that Respondent is required to perform under this Order, including Remedial Design, Remedial Action, Operation and Maintenance, and any activities required to be undertaken pursuant to Sections VII through XXIV, and XXVII of this Order.

## **VII. NOTICE OF INTENT TO COMPLY**

- 58. Respondent shall provide by facsimile, not later than eight (8) days after the effective date of this Order, written notice to EPA's Project Manager stating whether it will comply with the terms of this Order. If Respondent does not unequivocally commit to perform the RD and RA as provided by this Order, Respondent shall be deemed to have violated this Order and to have failed or refused to comply with this Order. Respondent's written notice shall describe, using facts that exist on or prior to the effective date of this Order, any "sufficient cause" defenses asserted by Respondent under Sections 106(b) and 107(c)(3) of CERCLA, 42 U.S.C. §§ 9606(b) and 9607(c)(3). The absence of a response by EPA to the notice required by this Paragraph shall not be deemed to be acceptance of Respondent's assertions.

## **VIII. PARTIES BOUND**

- 59. This Order shall apply to and be binding upon Respondent, its directors, officers, employees, agents, successors, and assigns. No change in the ownership, corporate status, or other control of Respondent shall alter any of Respondent's responsibilities under this Order.
- 60. Respondent shall provide a copy of this Order to any prospective owners or successors before a controlling interest in Respondent's assets, property rights, or stock are transferred to the prospective owner or successor. Respondent shall provide a copy of this Order to each contractor, sub-contractor, laboratory, or consultant retained to perform any Work under this Order, within five days after the effective date of this Order or on the date such services are retained, whichever date occurs later. Respondent shall also provide a copy of this Order to each person representing Respondent with respect to the PVOU or the Work and shall condition all contracts and subcontracts entered into hereunder upon performance of the Work in conformity with the terms of this Order. With regard to the activities undertaken pursuant to this Order, each contractor and subcontractor shall be deemed to be related by contract to Respondent within the meaning of Section 107(b)(3) of CERCLA, 42 U.S.C. § 9607(b)(3). Notwithstanding the terms of any contract, Respondent is responsible for compliance with this Order and for ensuring that its contractors, subcontractors and agents comply with this Order, and perform any Work in accordance with this Order.

61. Not later than sixty (60) days prior to any transfer by Respondent of any real property interest in any property included within the PVOU, Respondent shall submit a true and correct copy of the transfer document(s) to EPA, and shall identify the transferee by name, principal business address and effective date of the transfer.

### **IX. WORK TO BE PERFORMED**

62. Respondent shall cooperate with EPA in providing information regarding the Work to the public. As requested by EPA, Respondent shall participate in the preparation of such information for distribution to the public and in public meetings which may be held or sponsored by EPA to explain activities at or relating to the Site.
63. All aspects of the Work to be performed by Respondent pursuant to this Order shall be under the direction and supervision of a qualified project manager the selection of whom shall be subject to approval by EPA. Within twenty-one (21) days after the effective date of this Order, Respondent shall notify EPA in writing of the name and qualifications of the project manager, including primary support entities and staff, proposed to be used in carrying out Work under this Order. If at any time Respondent proposes to use a different project manager, Respondent shall notify EPA and shall obtain approval from EPA before the new project manager performs any Work under this Order.
64. EPA will review Respondent's selection of a project manager according to the terms of this Paragraph and Section XIV of this Order. If EPA disapproves of the selection of the project manager, Respondent shall submit to EPA within thirty (30) days after receipt of EPA's disapproval of the project manager previously selected, a list of project managers, including primary support entities and staff, that would be acceptable to Respondent. EPA will thereafter provide written notice to Respondent of the names of the project managers that are acceptable to EPA. Respondent may then select any approved project manager from that list and shall notify EPA of the name of the project manager selected within twenty-one (21) days of EPA's designation of approved project managers.
65. Within sixty (60) days after the effective date of this Order, Respondent shall submit a Compliance and Sentinel Well Network Plan to EPA for review and approval. The Compliance and Sentinel Well Network Plan shall describe the proposed locations and specifications of the compliance and sentinel wells. Within thirty (30) days after EPA approval of the work performed under the Compliance and Sentinel Well Network Plan, Respondent shall submit a Compliance and Sentinel Well Installation Complete Report.
66. Within sixty (60) days after the effective date of this Order, Respondent shall submit an initial RD/RA Work Plan to EPA for review and approval. Respondent shall update the RD/RA Work Plan in accordance with the SOW, and as otherwise required by EPA. The RD/RA Work Plan shall include a step-by-step plan for completing the Remedial Design and Remedial Action for the remedy described in the attached SOW and for attaining and maintaining all requirements, including the Performance Criteria, identified in the SOW and the ROD. The RD/RA Work Plan shall describe in detail the tasks and deliverables Respondent will complete during the Remedial Design and Remedial Action phases, and a schedule for completing all tasks and deliverables. Each iteration of the RD/RA Work

Plan shall, to the extent possible, describe the major tasks and deliverables, including, but not be limited to, the following: (1) a conceptual design/preliminary design; (2) a pre-final design; (3) identification and satisfactory compliance with applicable permitting requirements; (4) a sampling and analysis plan; (5) a Construction Quality Assurance Plan (CQAP); (6) an Operation and Maintenance Manual; and (7) a Compliance Monitoring Plan.

67. The RD/RA Work Plan shall provide for implementation of the attached SOW, and shall comport with EPA's "Superfund Remedial Design/Remedial Action Handbook," U.S. EPA, Office of Emergency and Remedial Response, June 15, 1995, EPA 540/R-95/059. Upon approval by EPA, the RD/RA Work Plan and future revisions or addenda to the RD/RA Work Plan are incorporated into this Order as a requirement of this Order and shall be an enforceable part of this Order.
68. Upon approval of the RD/RA Work Plan by EPA, Respondent shall complete the Remedial Design and perform the Remedial Action by implementing the RD/RA Work Plan according to the schedule in the approved RD/RA Work Plan. Any violation of the RD/RA Work Plan shall be a violation of this Order.
69. Respondent shall submit a Sampling and Analysis Plan and Site Health and Safety Plan for field activities with the Conceptual/Preliminary design. The Site Health and Safety Plan shall conform to the applicable Occupational Safety and Health Administration and EPA requirements, including but not limited to the requirements in 29 C.F.R. § 1910.120.
70. Within ninety (90) days after EPA approval of the RD/RA Work Plan, Respondent shall submit a Conceptual/Preliminary Design, to EPA for review and approval. The Conceptual/Preliminary Design submittal shall include, at a minimum, the following: (1) a detailed Design Basis Report that presents and justifies the concepts, assumption, standards, and preliminary interpretations and calculations used in the design; (2) plans, drawings, sketches, and specifications for groundwater extraction, treatment, conveyance, and monitoring systems; (3) an updated schedule for design, construction and operation of the Remedial Action; and (4) an updated list of substantive requirements, permits, regulatory agency approvals, MOUs, access or use agreements, easements, and properties developed or acquired to date; (5) copies of permits, approvals, and agreements not previously supplied to EPA; and (6) activities and schedules for obtaining outstanding items required before start of construction (e.g., for use of existing facilities or disposition of the treated water).
71. Within sixty (60) days after EPA approval of the Conceptual/Preliminary Design, Respondent shall submit a Pre-Final Design to EPA for review and approval. The Pre-Final Design shall be a draft version of the Final Design. The Pre-Final Design submittal shall include, at a minimum, the following: (1) revised plans and specifications; (2) a draft Operation and Maintenance Manual; and (3) a Construction Quality Assurance Plan (CQAP). The CQAP shall describe the approach to quality assurance during construction activities at the PVOU and shall specify a quality assurance official (QA Official), independent of the construction contractor, to conduct a quality assurance program during the construction phase of the project.

72. Upon EPA approval, the Pre-Final Design submittal shall become the Final Design and be incorporated into this Order as a requirement of this Order and shall be an enforceable part of this Order.
73. If Respondent seeks to retain a construction contractor to assist in the performance of the Remedial Action, then Respondent shall submit a copy of the contractor solicitation documents to EPA within five (5) days of selection of the contractor.
74. Forty-five (45) days after EPA approval of the Final Design, Respondent shall notify EPA in writing of the name, title, and qualifications of any construction contractors that may be used in carrying out work under this Order. EPA shall thereafter provide written notice of the name(s) of the contractor(s) it disapproves, if any. Respondent may select any contractor not disapproved and shall notify EPA of the name of the contractor selected within 5 days of selection. If at any time Respondent proposes to change the construction contractor, Respondent shall notify EPA and shall obtain approval from EPA as provided in this Paragraph, before the new construction contractor performs any work under this Order. If EPA disapproves of the selection of any contractor as the construction contractor, Respondent shall submit a list of contractors that would be acceptable to them to EPA within thirty (30) days after receipt of EPA's disapproval of the contractor previously selected.
75. The Work performed by Respondent pursuant to this Order shall, at a minimum, achieve the Performance Criteria specified in Section III of the SOW and the ROD, consistent with the approved Compliance Monitoring Plan.
76. Notwithstanding any action by EPA, Respondent shall remain fully responsible for achievement of the Performance Criteria in the SOW and the ROD. Nothing in this Order, or in the SOW or ROD, or in EPA's approval of the Remedial Design/Remedial Action Work Plan, or approval of any other submission, shall be deemed to constitute a warranty or representation of any kind by EPA that full performance of the Remedial Design or Remedial Action will achieve the Performance Criteria set forth in Section III of the SOW or in the ROD. Respondent's compliance with such approved documents does not foreclose EPA from seeking additional work to achieve the Performance Criteria.
77. Respondent shall, prior to any off-site shipment of hazardous substances from the PVOU to an out-of-state waste management facility, provide written notification to the appropriate state environmental official in the receiving state and to EPA's RPM of such shipment of hazardous substances. However, the notification of shipments shall not apply to any shipments when the total volume of all shipments from the PVOU to the state will not exceed ten (10) cubic yards.
  - A. The notification shall be in writing, and shall include the following information, where available: (1) the name and location of the facility to which the hazardous substances are to be shipped; (2) the type and quantity of the hazardous substances to be shipped; (3) the expected schedule for the shipment of the hazardous substances; and (4) the method of transportation. Respondent shall notify the

receiving state of major changes in the shipment plan, such as a decision to ship the hazardous substances to another facility within the same state, or to a facility in another state.

- B. The identity of the receiving facility and State will be determined by Respondent following the award of the contract for Remedial Action construction. Respondent shall provide all relevant information, including information under the categories noted in Paragraph 77.A above, on the shipments as soon as practicable after the award of the contract and before the hazardous substances are actually shipped.
78. Within forty-five (45) days after Respondent concludes that the Remedial Action, including all Operation and Maintenance activities, has been fully performed, Respondent shall so notify EPA and shall schedule and conduct a pre-certification inspection to be attended by Respondent and EPA. The pre-certification inspection shall be followed by a written report, submitted within thirty (30) days of the inspection by a registered professional engineer and Respondent's Project Manager, certifying that the Remedial Action has been completed in full satisfaction of the requirements of this Order. If, after completion of the pre-certification inspection and receipt and review of the written report, EPA determines that the Remedial Action or any portion thereof has not been completed in accordance with this Order, EPA shall notify Respondent in writing of the activities that must be undertaken to complete the Remedial Action and shall set forth in the notice a schedule for performance of such activities. Respondent shall perform all activities described in the notice in accordance with the specifications and schedules established therein. If EPA concludes, following the initial or any subsequent certification of completion by Respondent that the Remedial Action has been fully performed in accordance with this Order, EPA may notify Respondent that the Remedial Action has been fully performed. EPA's notification shall be based on present knowledge and Respondent's certification to EPA, and shall not limit EPA's right to perform periodic reviews pursuant to Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), or to take or require any action that in the judgment of EPA is appropriate at the PVOU, in accordance with Sections 104, 106, or 107 of CERCLA, 42 U.S.C. §§ 9604, 9606, or 9607, or any other applicable law.
79. Within thirty (30) days after Respondent concludes that all phases of the Work have been fully performed, that the Performance Criteria have been attained, and that all Operation and Maintenance activities have been completed, Respondent shall submit to EPA a written report by a registered professional engineer certifying that the Work has been completed in full satisfaction of the requirements of this Order. EPA shall require such additional activities as may be necessary to complete the Work or EPA may, based upon present knowledge and Respondent's certification to EPA, issue written notification to Respondent that the Work has been completed, as appropriate. EPA's notification shall not limit EPA's right to perform periodic reviews pursuant to Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), or to take or require any action that in the judgment of EPA is appropriate at the PVOU, in accordance with Sections 104, 106, or 107 of CERCLA, 42 U.S.C. §§ 9604, 9606, or 9607, or any other applicable law.

## **X. FAILURE TO ATTAIN PERFORMANCE CRITERIA**

80. Respondent shall be responsible for attaining and maintaining compliance with the Performance Criteria at all times. Failure to attain or maintain compliance with any of the Performance Criteria at any time is a violation of this Order which shall, at EPA's discretion, make Respondent subject to the enforcement actions and penalties set forth in Section XXVI of this Order.
81. Respondent shall not implement the Remedial Action or conduct Operation and Maintenance in such manner that it increases the migration of contamination into production wells that are not part of the interim remedial action or otherwise causes adverse effects. Respondent shall implement the Remedial Action and conduct Operation and Maintenance in such manner that it provides sufficient capture of contaminated groundwater without relying on the effects of groundwater extraction that is not part of the interim remedial action.
82. In the event that EPA determines that additional response activities are necessary to meet or maintain compliance with applicable Performance Criteria, EPA may require Respondent to perform additional response actions.
83. Unless otherwise stated by EPA, within thirty (30) days of receipt of notice from EPA that additional response activities are necessary to meet any applicable Performance Criteria, Respondent shall submit for approval by EPA a work plan for the additional response activities. The plan shall conform to the applicable requirements of Sections IX, XVI, and XVII of this Order. Upon EPA's approval of the plan pursuant to Section XIV, Respondent shall implement the plan for additional response activities in accordance with the provisions and schedule contained therein.

## **XI. EPA PERIODIC REVIEW**

84. Under Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), and any applicable regulations, EPA may conduct a review at the PVOU to assure that the Work performed pursuant to this Order adequately protects human health and the environment. Until such time as EPA certifies completion of the Work, Respondent shall conduct the requisite studies, investigations, or other response actions as determined necessary by EPA in order to permit EPA to conduct the review under Section 121(c) of CERCLA, 42 U.S.C. § 9621(c). As a result of any review performed under this Paragraph, Respondent may be required to perform additional Work or to modify Work previously performed.

## **XII. ADDITIONAL RESPONSE ACTIONS**

85. EPA may determine that in addition to the Work identified in this Order and attachments to this Order, additional response activities may be necessary to protect human health and the environment. If EPA determines that additional response activities are necessary, EPA may require Respondent to submit a work plan for additional response activities. EPA may also require Respondent to modify any plan, design, or other deliverable required by this Order, including any approved modifications.

86. Not later than thirty (30) days after receiving EPA's notice that additional response activities are required pursuant to this Section, Respondent shall submit a work plan for the response activities to EPA for review and approval. Upon approval by EPA, the work plan is incorporated into this Order as a requirement of this Order and shall be an enforceable part of this Order. Upon approval of the work plan by EPA, Respondent shall implement the work plan according to the standards, specifications, and schedule in the approved work plan. Respondent shall notify EPA of its intent to perform such additional response activities within seven (7) days after receipt of EPA's request for additional response activities.

### **XIII. ENDANGERMENT AND EMERGENCY RESPONSE**

87. In the event of any action or occurrence during the performance of the Work which causes or threatens to cause a release of a hazardous substance or which may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action to prevent, abate, or minimize the threat, and shall immediately notify EPA's Remedial Project Manager (RPM) or, if the RPM is unavailable, the RPM's Section Chief. If neither of these persons is available, Respondent shall notify the EPA Emergency Response Section, Region 9. Respondent shall take such action in consultation with EPA's RPM and in accordance with all applicable provisions of this Order, including but not limited to the Health and Safety Plan. In the event that Respondent fails to take appropriate response action as required by this Section, and EPA takes that action instead, Respondent shall reimburse EPA for all costs of the response action not inconsistent with the NCP. Respondent shall pay the Response Costs in the manner described in Section XXIV of this Order, within thirty (30) days of Respondent's receipt of demand for payment and a reconciled EPA financial cost summary of the costs incurred.
88. Nothing in the preceding Paragraph shall be deemed to limit any authority of the United States to take, direct, or order all appropriate action to protect human health and the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances on, at, or from the PVOU.

### **XIV. EPA REVIEW OF SUBMISSIONS**

89. All deliverables shall be submitted to EPA, LARWQCB, and DTSC concurrently. After review of any deliverable, plan, report or other item which is required to be submitted for review and approval pursuant to this Order, EPA may: (a) approve the submission; (b) approve the submission with modifications; (c) disapprove the submission and direct Respondent to re-submit the document after incorporating EPA's comments; or (d) disapprove the submission and assume responsibility for performing all or any part of the response action. As used in this Order, the terms "approval by EPA," "EPA approval," or a similar term means the action described in items (a) or (b) of this Paragraph.
90. In the event of approval or approval with modifications by EPA, Respondent shall proceed to take any action required by the plan, report, or other item, as approved or modified by EPA.

91. Upon receipt of a notice of disapproval or a request for a modification, Respondent shall, within the time specified in the attached SOW or such longer time as specified by EPA in its notice of disapproval or request for modification, correct the deficiencies and resubmit the plan, report, or other item for approval. Notwithstanding the notice of disapproval, or approval with modifications, Respondent shall proceed, at the direction of EPA, to take any action required by any non-deficient portion of the submission.
92. If any submission is disapproved by EPA, Respondent shall be deemed to be in violation of this Order.

#### **XV. PROGRESS REPORTS**

93. In addition to the other deliverables set forth in this Order, Respondent shall provide monthly progress reports to EPA with respect to actions and activities undertaken pursuant to this Order. The progress reports shall be submitted on or before the 10<sup>th</sup> day of each month following the effective date of this Order. Respondent's obligation to submit progress reports continues until EPA gives Respondent written notice that the Work has been completed. At a minimum these progress reports shall: (1) describe the actions which have been taken to comply with this Order during the prior month; (2) summarize test, sampling, or operating data generated or obtained by Respondent and not previously submitted to EPA; (3) provide any preliminary calculations and supporting data used to evaluate performance; (4) describe all work planned for the next two months with schedules relating such work to the overall project schedule for RD/RA completion; and (5) describe all problems encountered (including the nature of and duration of any noncompliance) and any anticipated problems, any actual or anticipated delays, and solutions developed and implemented to address any actual or anticipated problems or delays.

#### **XVI. QUALITY ASSURANCE, SAMPLING AND DATA ANALYSIS**

94. Respondent shall use the quality assurance, quality control, and chain of custody procedures described in the "EPA NEIC Policies and Procedures Manual," May 1978, revised May 1986, "EPA Guidance for the Data Quality Objectives Process" (EPA QA/G-4), "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations," November 1999 (EPA QA/R-5), "Guidance for Quality Assurance Project Plans" February 1998 (EPA QA/G-5), EPA Region 9 "Sampling and Analysis Plan Guidance and Template, Version 2," March 2000 (R9QA/002), and any amendments to these documents, while conducting all sample collection and analysis activities required herein by any plan. To provide quality assurance and maintain quality control, Respondent shall:
  - A. Use only laboratories which have a documented Quality Assurance Program that complies with EPA guidance document EPA QA/R-5 (EPA Requirements for Quality Assurance Project Plans).

- B. Ensure that the laboratory used by Respondent for analyses performs according to a method or methods deemed satisfactory to EPA, is prepared to submit all protocols to be used for analyses to EPA at least 14 days before beginning analysis (if requested), and maintains protocols according to the record preservation requirements included in Section XXI.
  - C. Ensure that EPA personnel and EPA's authorized representatives are allowed access to the laboratory and personnel utilized by Respondent for analyses.
95. Respondent shall notify EPA not less than fourteen (14) days in advance of any sample collection activity. At the request of EPA, Respondent shall allow split or duplicate samples to be taken by EPA or its authorized representatives, of any samples collected by Respondent with regard to the PVOU or pursuant to the implementation of this Order. In addition, EPA shall have the right to take any additional samples that EPA deems necessary.

#### **XVII. COMPLIANCE WITH APPLICABLE LAWS**

96. All activities by Respondent pursuant to this Order shall be performed in accordance with the requirements of all Federal and state laws and regulations. EPA has determined that the activities contemplated by this Order are consistent with the NCP.
97. Except as provided in Section 121(e) of CERCLA and the NCP, no permit shall be required for any portion of the Work conducted entirely on-site (i.e., within the areal extent of contamination at the PVOU or in very close proximity to the contamination and necessary for implementation of the Work). The service of treated groundwater to the public is considered to be an off-site activity. Where any portion of the Work requires a Federal or state permit or approval, Respondent shall submit timely and complete applications and take all other actions necessary to obtain and to comply with all such permits or approvals.
98. This Order is not, and shall not be construed to be, a permit issued pursuant to any Federal or state statute or regulation.
99. All materials removed from the PVOU shall be disposed of or treated at a facility approved by EPA's RPM and in accordance with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3); with the U.S. EPA Off-Site Rule, 40 C.F.R. § 300.440; and with all other applicable Federal, state, and local requirements.

#### **XVIII. EPA PROJECT MANAGER**

100. All communications, whether written or oral, from Respondent to EPA shall be directed to EPA's Project Manager. Respondent shall submit to EPA three copies of all documents, including plans, reports, and other correspondence, which are developed pursuant to this Order, and shall send these documents by overnight mail or by certified mail, return receipt

requested. Respondent shall also submit one copy of each deliverable to the project managers for DTSC, LARWQCB, and any other State agencies, as specified by the EPA Project Manager.

(A) EPA's Project Manager is:

Penelope McDaniel  
U.S. Environmental Protection Agency, Region IX  
75 Hawthorne Street (SFD-7-3)  
San Francisco, CA 94105  
phone: (415) 744-2407  
fax: (415) 744-2180  
email: mcdaniel.penelope@epa.gov

(B) DTSC's Project Manager is:

Jacalyn Spizman  
California Department of Toxic Substances Control  
5796 Corporate Avenue  
Cypress, CA 90630  
phone: (714) 484-5460  
fax: (714) 484-5438  
email: jspizma@dtsc.ca.gov

(C) LARWQCB's Project Manager is:

Dixon Oriola  
Los Angeles Regional Water Quality Control Board  
320 West 4<sup>th</sup> Street, Suite 200  
Los Angeles, CA 90013  
phone: (213) 576-6803  
fax: (213) 576-6717  
email: doriola@rb4swrcb.ca.gov

One or more copies of each deliverable shall also be sent to EPA contractors, as specified by the EPA Project Manager.

101. EPA has the unreviewable right to change its Project Manager. If EPA changes its Project Manager, EPA will inform Respondent in writing of the name, address, and telephone number of the new Project Manager.
102. EPA's Project Manager shall have the authority lawfully vested in a Remedial Project Manager (RPM) and On-Scene Coordinator (OSC) by the National Contingency Plan, 40 C.F.R. Part 300. EPA's Project Manager shall have authority, consistent with the National Contingency Plan, to halt any work required by this Order, and to take any necessary response action.

### **XIX. ACCESS TO SITE NOT OWNED BY RESPONDENT**

103. To the extent that access to any portion of the PVOU, or any other property, owned or controlled by persons other than Respondent is necessary in order to perform the Work required by this Order, Respondent will obtain, or use its best efforts to obtain, site access agreements from the present owner(s) within 60 days of the effective date of this Order. Such agreements shall provide access for EPA, its contractors and oversight officials, the state and its contractors, and Respondent or Respondent's authorized representatives and contractors, and such agreements shall specify that Respondent is not EPA's representative with respect to liability associated with activities at the property. Respondent shall save and hold harmless the United States and its officials, agents, employees, contractors, subcontractors, or representatives for or from any and all claims or causes of action or other costs incurred by the United States including but not limited to attorneys fees and other expenses of litigation and settlement arising from or on account of acts or omissions of Respondent, its officers, directors, employees, agents, contractors, subcontractors, and any persons acting on Respondent's behalf or under its control, in carrying out activities pursuant to this Order, including any claims arising from any designation of Respondent as EPA's authorized representatives under Section 104(e) of CERCLA. Copies of such agreements shall be provided to EPA prior to Respondent's initiation of field activities. Respondent's best efforts shall include the payment of reasonable sums of money in consideration of access. If access agreements are not obtained within the time referenced above, Respondent shall immediately notify EPA of its failure to obtain access. Subject to the United States' non-reviewable discretion, EPA may use its legal authorities to obtain access for Respondent, may perform those response actions with EPA contractors at the property in question, or may terminate the Order if Respondent cannot obtain access agreements. If EPA performs those tasks or activities with contractors and does not terminate the Order, Respondent shall perform all other activities not requiring access to that property, and shall reimburse EPA, pursuant to Section XXIV of this Order, for all costs incurred in performing such activities. Respondent shall integrate the results of any such tasks undertaken by EPA into its reports and deliverables. Respondent shall reimburse EPA, pursuant to Section XXIV of this Order, for all Response Costs (including attorney fees) incurred by the United States to obtain access for Respondent.

### **XX. SITE ACCESS AND DATA/DOCUMENT AVAILABILITY**

104. Respondent shall allow EPA and its authorized representatives and contractors to enter and freely move about all property at the PVOU to which Respondent has access and which is subject to or affected by the work under this Order or where documents required to be prepared or maintained by this Order are located, for the following purposes: inspecting conditions, activities, the results of activities, records, operating logs, and contracts related to the Work or Respondent and its representatives or contractors pursuant to this Order; reviewing the progress of Respondent in carrying out the terms of this Order; conducting tests as EPA or its authorized representatives or contractors deem necessary; using a camera, sound recording device or other documentary type equipment; and verifying the data submitted to EPA by Respondent. Respondent shall allow EPA and its authorized representatives to enter any property within the PVOU to which Respondent has access, to inspect and copy all records, files, photographs, documents, sampling and monitoring data,

and other writings related to Work undertaken in carrying out this Order. Nothing herein shall be interpreted as limiting or affecting EPA's right of entry or inspection authority under Federal law.

105. Respondent may assert a claim of business confidentiality covering part or all of the information submitted to EPA pursuant to the terms of this Order under 40 C.F.R. § 2.203, provided such claim is not inconsistent with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7) or other provisions of law. This claim shall be asserted in the manner described by 40 C.F.R. § 2.203(b) and substantiated by Respondent at the time the claim is made. Information determined to be confidential by EPA will be given the protection specified in 40 C.F.R. Part 2. If no such claim accompanies the information when it is submitted to EPA, it may be made available to the public by EPA or the state without further notice to Respondent. Respondent shall not assert confidentiality claims with respect to any data related to conditions, sampling, or monitoring within the PVOU.
106. Respondent shall maintain for the period during which this Order is in effect, an index of documents that Respondent claims contain confidential business information. The index shall contain, for each document, the date, author, addressee, and subject of the document. Upon written request from EPA, Respondent shall submit a copy of the index to EPA.

## **XXI. RECORD PRESERVATION**

107. Respondent shall provide to EPA upon request, copies of all documents and information within its possession and/or control or that of its contractors or agents relating to activities at or near the PVOU or to the implementation of this Order, including but not limited to sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondent shall also make available to EPA for purposes of investigation, information gathering, or testimony, its employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.
108. Until six (6) years after EPA provides notice that all Work required under this Order has been completed, Respondent shall preserve and retain all records and documents in its possession or control, and shall instruct its contractors and agents to preserve and retain all records and documents in its possession or control, that relate in any manner to the PVOU or the Work. At the conclusion of this document retention period, Respondent shall notify the United States at least ninety (90) calendar days prior to the destruction of any such records or documents, and upon request by the United States, Respondent shall deliver any such records or documents to EPA.
109. Within forty-five (45) days after the effective date of this Order, Respondent shall submit a written certification to EPA's RPM that it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information relating to its potential liability with regard to the PVOU since notification of potential liability by the United States or the State or the filing of suit against it regarding the PVOU. Respondent shall not dispose of any such documents without prior approval by EPA. Respondent shall,

upon EPA's request and at no cost to EPA, deliver the documents or copies of the documents to EPA.

## **XXII. DELAY IN PERFORMANCE**

110. Any delay in performance of this Order that, in EPA's judgment, is not properly justified by Respondent under the terms of this Section shall be considered a violation of this Order. Any delay in performance of this Order shall not affect Respondent's obligations to fully perform all obligations under the terms and conditions of this Order.
111. Respondent shall notify EPA of any delay or anticipated delay in performing any requirement of this Order. Such notification shall be made by telephone to EPA's Project Manager within forty eight (48) hours after Respondent first knew or should have known that a delay might occur. Respondent shall adopt all reasonable measures to avoid or minimize any such delay. Within five (5) business days after notifying EPA by telephone, Respondent shall provide written notification fully describing the nature of the delay, any justification for delay, any reason why Respondent should not be held strictly accountable for failing to comply with any relevant requirements of this Order, the measures planned and taken to minimize the delay, and a schedule for implementing the measures that will be taken to mitigate the effect of the delay. Increased costs or expenses associated with implementation of the activities called for in this Order is not a justification for any delay in performance.

## **XXIII. ASSURANCE OF ABILITY TO COMPLETE WORK**

112. Respondent shall demonstrate the ability to complete the Work required by this Order and to pay all claims that arise from the performance of the Work by obtaining and presenting to EPA within sixty (60) days after the effective date of this Order, one of the following: (1) a performance bond; (2) a letter of credit; (3) a guarantee by a third party; or (4) internal financial information to allow EPA to determine that Respondent has sufficient assets available to perform the Work. Respondent shall demonstrate financial assurance in an amount no less than \$13 million. If Respondent seeks to demonstrate its ability to complete the Remedial Action by means of internal financial information, or by guarantee of a third party, Respondent shall re-submit such information annually, on the anniversary of the effective date of this Order. If EPA determines that such financial information is inadequate, Respondent shall, within thirty (30) days after receipt of EPA's notice of determination, obtain and present to EPA for approval one of the other three forms of financial assurance listed above.
113. At least seven (7) days prior to commencing any work at the PVOU pursuant to this Order, Respondent shall submit to EPA a certification that Respondent or its contractors and subcontractors have adequate insurance coverage or have indemnification for liabilities for injuries or damages to persons or property which may result from the activities to be conducted by or on behalf of Respondent pursuant to this Order. Respondent shall ensure that such insurance or indemnification is maintained for the duration of the Work required by this Order.

#### **XXIV. REIMBURSEMENT OF RESPONSE COSTS**

114. Respondent shall reimburse EPA, upon written demand, for all Response Costs incurred by the United States in overseeing Respondent's implementation of the requirements of this Order or in performing any response action which Respondent fails to perform in compliance with this Order. EPA may submit to Respondent on a periodic basis an accounting of all Response Costs incurred by the United States with respect to this Order. EPA's certified Agency Financial Management System summary data (SPUR Reports), or such other summary as certified by EPA, shall serve as basis for payment demands.
115. Respondent shall, within thirty (30) days of receipt of each EPA accounting, remit a certified or cashier's check for the amount of those costs. Interest shall accrue from the later of the date that payment of a specified amount is demanded in writing or the date of the expenditure. The interest rate is the rate established by the Department of the Treasury pursuant to 31 U.S.C. § 3717 and 4 C.F.R. § 102.13.
116. Checks shall be made payable to the Hazardous Substances Superfund and shall include a reference to the Puente Valley Operable Unit of the San Gabriel Valley Superfund Sites, the site identification number (CAD980817985), the account number (098V), and the title of this Order. Checks shall be forwarded to:
- U.S. Environmental Protection Agency - Region 9  
ATTENTION: Superfund Accounting  
P.O. Box 360863M  
Pittsburgh, PA 15251
117. Respondent shall send copies of each transmittal letter and check to the EPA Project Manager.

#### **XXV. UNITED STATES NOT LIABLE**

118. The United States, by issuance of this Order, assumes no liability for any injuries or damages to persons or property resulting from acts or omissions by Respondent, or its directors, officers, employees, agents, representatives, successors, assigns, contractors, or consultants in carrying out any action or activity pursuant to this Order. Neither EPA nor the United States may be deemed to be a party to any contract entered into by Respondent or its directors, officers, employees, agents, successors, assigns, contractors, or consultants in carrying out any action or activity pursuant to this Order.

#### **XXVI. ENFORCEMENT AND RESERVATIONS**

119. EPA reserves the right to bring an action against Respondent under Section 107 of CERCLA, 42 U.S.C. § 9607, for recovery of any Response Costs incurred by the United States related to this Order and not reimbursed by Respondent. This reservation shall include but not be limited to past costs, future costs, direct costs, indirect costs, the costs of oversight, the costs of compiling the cost documentation to support oversight cost demand, as well as accrued interest as provided in Section 107(a) of CERCLA.

120. Notwithstanding any other provision of this Order, at any time during the response action, EPA may perform its own studies, complete the response action (or any portion of the response action) as provided in CERCLA and the NCP, and seek reimbursement from Respondent for its costs, or seek any other appropriate relief.
121. Nothing in this Order shall preclude EPA from taking any additional enforcement actions, including modification of this Order or issuance of additional Orders, and/or additional remedial or removal actions as EPA may deem necessary, or from requiring Respondent in the future to perform additional activities pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a), or any other applicable law. Respondent shall be liable under CERCLA Section 107(a), 42 U.S.C. § 9607(a), for the costs of any such additional actions under CERCLA.
122. Notwithstanding any provision of this Order, the United States hereby retains all of its information gathering, inspection and enforcement authorities and rights under CERCLA, RCRA and any other applicable statutes or regulations.
123. Respondent shall be subject to civil penalties under Section 106(b) of CERCLA, 42 U.S.C. § 9606(b), of not more than \$27,500 for each day in which Respondent willfully violates, or fails or refuses to comply with this Order without sufficient cause. In addition, failure to properly provide response action under this Order, or any portion hereof, including failure to attain or maintain compliance with the Performance Criteria, without sufficient cause, may result in liability under Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3), for punitive damages in an amount at least equal to, and not more than three times the amount of any costs incurred by the Fund as a result of such failure to take proper action.
124. Nothing in this Order shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person for any liability it may have arising out of or relating in any way to the Site.
125. If a court issues an order that invalidates any provision of this Order or finds that Respondent has sufficient cause not to comply with one or more provisions of this Order, Respondent shall remain bound to comply with all provisions of this Order not invalidated by the court's order.

## **XXVII. ADMINISTRATIVE RECORD**

126. Upon request by EPA, Respondent must submit to EPA all documents related to the selection of the response action for possible inclusion in the administrative record file.

## **XXVIII. EFFECTIVE DATE AND COMPUTATION OF TIME**

127. This Order shall be effective five (5) days after the Order is signed by the Director of the Superfund Division, U.S. EPA Region 9. All times for performance of ordered activities shall be calculated from this effective date.

### XXIX. OPPORTUNITY TO CONFER

128. Respondent may, within ten (10) days after the date this Order is signed, request a conference with EPA's RPM and Assistant Regional Counsel to discuss this Order. If requested, the conference shall occur at EPA's regional offices at a date and time to be determined by EPA. Nothing in this Paragraph shall alter Respondent's obligation under Paragraph 58 to provide timely written notice of its intent to comply with this Order.
129. The purpose and scope of the conference shall be limited to issues involving the implementation of the response actions required by this Order and the extent to which Respondent intends to comply with this Order. This conference is not an evidentiary hearing, and does not constitute a proceeding to challenge this Order. It does not give Respondent a right to seek review of this Order, or to seek resolution of potential liability, and no official stenographic record of the conference will be made. At any conference held pursuant to Respondent's request, Respondent may appear in person or by an attorney or other representative.
130. Requests for a conference must be by telephone followed by written confirmation mailed that day to Brett Moffatt, (415) 744-1374, facsimile (415) 744-1041, U.S. EPA Region 9, 75 Hawthorne Street (ORC-3), San Francisco, CA 94105.

So Ordered, this 13<sup>th</sup> day of September, 2001.

BY: Elizabeth J. Adams for Keith Takata  
Keith Takata  
Director, Superfund Division  
U.S. Environmental Protection Agency, Region IX

**INTERIM RECORD OF DECISION**

**SAN GABRIEL VALLEY SUPERFUND SITE**  
**PUENTE VALLEY OPERABLE UNIT**  
**CITY OF INDUSTRY, CALIFORNIA**

**Volume 1**

**September 1998**

**United States Environmental Protection Agency**  
**Region IX - San Francisco, California**

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# Declaration

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## Site Name and Location

This Interim Record of Decision (ROD) addresses the contamination at the Puente Valley Operable Unit (PVOU) located within the San Gabriel Valley Superfund Site in Los Angeles County, California.

## Statement of Basis and Purpose

This ROD presents the selected interim remedial action for the PVOU of the San Gabriel Valley Superfund Site in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. §§ 9601 et. seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (collectively referred to herein as CERCLA) and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300 (NCP). This decision is based on the Administrative Record for this site.

The State of California, acting through the California Department of Toxic Substances Control (DTSC) and the Los Angeles Regional Water Quality Control Board (RWQCB), concur with the selected remedy.

## Assessment of the Site

The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

## Description of the Interim Action

This ROD addresses ground water contaminated with volatile organic compounds (VOCs). EPA's objective is to protect human health and the environment. The selected remedy is containment of ground water contaminated with VOCs in the shallow and intermediate zones at the mouth of Puente Valley to prevent further migration of existing ground-water contamination. This remedy includes performance criteria that will require extraction and treatment of contaminated ground water at certain locations along the downgradient edge of the contamination and will require continued monitoring and evaluation at other locations. Treated ground water will be provided to local water purveyors or discharged to Puente Creek, immediately upstream of San Jose Creek. In addition, this remedy includes monitoring in the shallow, intermediate, and deep ground-water zones at mid-valley and at the mouth of the valley.

## Statutory Determinations

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action and is cost effective. Performance criteria and remediation components of the selected remedy satisfy the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

Because this remedy will result in hazardous substances remaining onsite above health-based levels, a review will be conducted at least once every five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Keith A. Takata

Keith A. Takata  
Director of Superfund Division  
U.S. Environmental Protection Agency, Region IX

9-30-98

Date

## **Part I**

### **Decision Summary**

### 3 Enforcement Activities

---

EPA began its enforcement efforts in the PVOU in 1985 by searching historical federal, state, and local records for evidence of chemical usage, handling, and disposal in the Puente Valley area. At approximately the same time, the RWQCB initiated its Well Investigation Program (WIP) to identify sources of ground-water contamination. In 1989, EPA entered into a cooperative agreement with the RWQCB to expand the WIP program, to assist EPA in determining the nature and extent of the sources of ground-water contamination in the San Gabriel Valley, and to identify responsible parties. The RWQCB directly oversees facility-specific investigations in the Puente Valley area; EPA helps fund these activities and, when necessary, uses its enforcement authority to obtain information and ensure that facility investigations are promptly completed.

As of September 1998, the RWQCB has sent chemical use questionnaires to approximately 730 facilities in the Puente Valley area; inspected approximately 650 of these facilities; and directed approximately 190 facilities to perform soil, soil gas, and/or ground-water investigations. EPA has concurrently used its authority under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to request information from more than 150 current and former owners and operators in the PVOU. From these investigations, EPA has identified 50 facilities as sources of ground-water contamination for the PVOU.

From 1990 through 1993, EPA sent General Notice of Liability letters to approximately 109 entities in and around the Puente Valley area. On May 26, 1993, EPA sent Special Notice letters to 58 potentially responsible parties (PRPs), requesting that these parties present a good faith offer to perform the RI/FS for the PVOU. Forty-two of these PRPs formed the PVSC and in September 1993 entered into an AOC with EPA to conduct the RI/FS. Also in September 1993, EPA issued a Unilateral Administrative Order (UAO) to two PRPs, Goe Engineering and Diversey Corporation, that failed to present a good faith offer. Diversey Corporation completed the activities that the UAO required in 1996, and the PVSC and EPA completed the RI/FS in May 1997.

Since 1993, EPA and the RWQCB have continued to investigate potential sources of contamination. In June 1997, EPA notified 11 additional entities that they had been identified as PRPs. EPA is now in the process of identifying a final group of PRPs for the PVOU. EPA will contact the new PRPs shortly after the ROD is issued. EPA anticipates issuing Special Notice letters to the Puente Valley PRPs a few months after all of the PRPs have been identified; however, EPA may offer to settle with some of the smaller PRPs in lieu of issuing Special Notice letters.

EPA and the RWQCB have undertaken enforcement activities elsewhere in the San Gabriel Valley, including facility investigations, issuance of CERCLA section 104(e) requests for information, issuance of General and Special Notice letters, and filing of cost recovery litigation. PRPs in the El Monte and South El Monte OUs have entered into Administrative Consent Orders to perform the RI/FS for their respective OUs. EPA also issued UAOs to two parties in the El Monte OU. In the Baldwin Park OU, EPA issued a ROD in March 1993,

and in May 1997 sent Special Notice letters to 19 PRPs seeking performance of the remedial design and remedial action (RD/RA). Soon thereafter, perchlorate contamination was discovered in the Baldwin Park OU, leading EPA to initiate an amendment of the ROD and extend the deadline for the submission of a good faith offer to July 1999.

## 4 Scope and Role of this Document

---

There are four areas of ground-water contamination in the San Gabriel Basin aquifer listed on the NPL as San Gabriel Valley Areas 1 through 4. The San Gabriel Valley has been divided into eight different OUs: Alhambra, Baldwin Park, El Monte, South El Monte, Whittier Narrows, Suburban, Richwood, and Puente Valley (Figure 1). The PVOU addresses ground-water contamination corresponding to the San Gabriel Valley Area 4 NPL site.

EPA initiated an overall RI/FS for the entire San Gabriel site in 1984 with a preliminary investigation termed the Supplemental Sampling Program. This investigation was completed in 1986 and included the sampling of 70 existing ground-water wells for a full range of organic contaminants, collection and evaluation of existing data, and regional ground-water flow modelling. Data were compiled and reviewed to develop a preliminary conceptual hydrogeologic model of the San Gabriel Valley. The results of the investigations provided much of the basis for planning the remedial investigations that have been performed in the San Gabriel Valley since 1986.

The PVOU is classified as an interim action because it is intended to control the migration of contamination. Additional remediation may be needed to clean up VOC contamination remaining in the ground water. EPA will use information collected during operation of the selected remedy to help determine the need for additional actions and the nature of the final remedy. This interim action will neither be inconsistent with, nor preclude, implementation of the final remedy. All of the OU specific actions currently being undertaken in the San Gabriel Valley are interim actions. It is anticipated that a final ROD will be issued for the entire San Gabriel Valley Superfund site once RD/RA work has been completed at all of the separate OUs.

## 5 Highlights of Community Participation

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The Proposed Plan for this remedy, in the form of a fact sheet, was distributed to the parties on EPA's mailing list for the PVOU. The Proposed Plan, together with the Puente Valley Operable Unit Interim Remedial Investigation (RI) (CDM, 1997) and Feasibility Study (FS) (EPA, 1997), were also made available at EPA's Regional Office in San Francisco, and locally at three information repositories: the Hacienda Heights Public Library, the West Covina Library, and the Rosemead Library. The Administrative Record for the PVOU was placed in CD-ROM format in each repository, and the RI/FS was available on microfilm at each repository.

EPA held a public meeting to present the Proposed Plan and EPA's preferred alternative on January 28, 1998, at the La Puente High School in La Puente, California. Notice of EPA's public meetings, availability of the Proposed Plan, and the announcement of a 30-day public comment period were published in the following newspapers:

- Los Angeles Times, San Gabriel Valley Edition                      January 16, 1998
- San Gabriel Valley Tribune    January 16, 1998

EPA extended the public comment period in response to requests from members of the public. EPA prepared a fact sheet announcing the extension of the public comment period and distributed it to the parties on EPA's mailing list for the PVOU. The total public comment period was 60 days and ran from January 15 to March 16, 1998. EPA received several sets of written comments during the public comment period. These comments are addressed in the Responsiveness Summary, included as Part II of this ROD (contained in Volume 2).

This decision document presents the selected remedial action for the ROD site and has been chosen in accordance with CERCLA, as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The ROD is based on the Administrative Record.

## 6 Summary of Site Characteristics

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The PVOU is part of the San Gabriel Valley Superfund Site located in eastern Los Angeles County, California. Puente Valley is an approximately 12-1/2-mile-long and 2- to 2-1/2-mile-wide tributary basin to the Main San Gabriel Basin.

The majority of the PVOU is highly industrialized and is occupied by the City of Industry, an incorporated city that covers approximately 11 square miles. Approximately 96 percent of the city is zoned for industrial purposes; the rest is zoned for commercial purposes. Nearly 85 percent of the land within the boundaries of the City of Industry has been developed, and accommodates approximately 1,700 businesses. Future development plans will likely be for industrial and commercial uses.

A small amount of land within the City of Industry is allotted for residential purposes and is occupied by approximately 631 residents. The Cities of La Puente and Walnut also occupy portions of the PVOU. These portions are zoned primarily for residential purposes and are likely to remain residential.

The State of California considers all subsurface zones of relatively high permeability (shallow, intermediate, and deep) in the PVOU to be municipal water sources. VOCs are the primary organic contaminants found in the PVOU above EPA maximum contaminant levels (MCLs). Tetrachloroethene (PCE) and trichloroethene (TCE) are the VOCs that have been detected most often in ground water, although 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethene, and 1,1,1-trichloroethane have also been detected above MCLs in the PVOU. Figures 2 and 3 show 1997 VOC concentrations in the shallow and intermediate zones.

Sources of the ground-water contamination include firms engaged in metal cleaning, coating, and manufacturing; chemical product manufacturing; plastics; aerosols; electric component manufacturing; printing; rubber manufacturing; die casting; and engineering. To address these sources of ground-water contamination, the RWQCB, under a grant from EPA, oversees investigations and cleanups at facilities where releases have occurred. In general, VOC concentrations are highest in the shallow ground water beneath facility source areas where releases have occurred. VOCs have also spread to the intermediate zone and portions of the deep zone primarily as a result of downward hydraulic gradients.

## 7 Summary of Site Risks

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In 1994, EPA completed a Preliminary Baseline Risk Assessment for the Puente Valley OU (EPA, 1994). The purpose of the risk assessment was to evaluate potential adverse health effects from exposure to contaminated ground water. The results of the risk assessment assisted EPA to determine if any remedial actions would be necessary to protect human health or the environment. The risk assessment process included: (a) identifying chemicals present in ground water, (b) characterizing the population potentially exposed to these contaminants, and (c) evaluating the potential health effects resulting from exposure to the contaminated ground water. EPA has evaluated how individuals might be exposed to these contaminants under both current and future conditions, and potential risks to natural resources.

### 7.1 Identification of Chemicals of Potential Concern

Fifty-four VOCs detected in ground water from production and monitoring wells in the PVOU were included in the risk assessment as chemicals of potential concern (COPCs) in ground water. Eight VOCs detected in surface water samples were included in the risk assessment as COPCs in surface water. (See Tables 2 and 3 in the Puente Valley Operable Unit Preliminary Baseline Risk Assessment prepared by CH2M HILL for the EPA, March 1, 1994.) Table 1 summarizes the COPCs in ground water used in the baseline risk assessment, and their respective applicable or relevant and appropriate requirements (ARARs).

### 7.2 Exposure Assessment

Exposure assessment is the determination or estimation of the magnitude, frequency, duration, and route of exposure. This section briefly summarizes the potentially exposed populations, the exposure pathways evaluated, and the exposure quantification from the risk assessment performed for the PVOU.

Land use in the PVOU includes primarily commercial/industrial and residential. Ground water from five of the seven production wells sampled in 1991 and 1992 is currently being used for domestic purposes. Exposure to contaminants in ground water could occur through the use of ground water for domestic purposes, such as ingestion of water used for drinking and cooking. Residents and workers could also be exposed to contaminants in ground water through the transport of VOCs from ground water through soil and into ambient air or through the foundation of a building. EPA evaluated three scenarios in the risk assessment for the PVOU in which individuals might be exposed to the contaminated ground water:

1. Potential for a current resident to be exposed to contamination in ground water through domestic use
2. Potential for a future resident to be exposed to contamination in ground water through domestic use

3. Potential for current and future workers and residents to be exposed to contamination in ground water through transport of VOCs from ground water through the foundation of a building

EPA evaluates potential exposure to contaminated ground water in the absence of regulatory controls, such as the Safe Drinking Water Act, which is designed to prevent delivery of water for potable use if contaminant concentrations exceed MCLs. Based on potential for exposure frequency, duration, and estimated intake, residents exposed to contaminated ground water used for domestic purposes are expected to be the maximally exposed population.

## 7.3 Toxicity Assessment

Table 1 shows the COPCs for the PVOU. One of the compounds, vinyl chloride, is a known human carcinogen (EPA weight of evidence class A); four of the compounds (tetrachloroethene, trichloroethene, 1,2-dichloroethane, and methylene chloride) are probable human carcinogens (EPA weight of evidence class B2); and three of the compounds (1,4-dichlorobenzene, 1,1-dichloroethene, and 1,1,2-trichloroethane) are possible human carcinogens (EPA weight of evidence class C). Based on data from various animal studies, the oral carcinogenic slope factors for these compounds are:

Vinyl Chloride –  $1.9 \text{ (mg/kg/day)}^{-1}$  (Source: Health Effects Assessment Summary Tables (HEAST), EPA, 1992a).

Tetrachloroethene –  $0.051 \text{ (mg/kg/day)}^{-1}$  (Source: Environmental Criteria and Assessment Office, EPA, 1993b).

Trichloroethene –  $0.011 \text{ (mg/kg/day)}^{-1}$  (Source: Health Effects Assessment Summary Tables, EPA, 1992a).

1,2-Dichloroethane –  $0.091 \text{ (mg/kg/day)}^{-1}$  (Source: Integrated Risk Information System (IRIS), EPA, 1993a).

Methylene Chloride –  $0.0075 \text{ (mg/kg/day)}^{-1}$  (Source: Integrated Risk Information System (IRIS), EPA, 1993a).

1,4-Dichlorobenzene –  $0.024 \text{ (mg/kg/day)}^{-1}$  (Source: Health Effects Assessment Summary Tables, EPA, 1992a).

1,1,2-Trichloroethane –  $0.057 \text{ (mg/kg/day)}^{-1}$  (Source: Integrated Risk Information System (IRIS), EPA, 1993a).

With the exception of 1,4-dichlorobenzene, all of the above compounds are also considered carcinogenic through the inhalation route. Based on data from various animal studies, the inhalation carcinogenic slope factors are:

Vinyl Chloride –  $0.3 \text{ (mg/kg/day)}^{-1}$  (Source: Health Effects Assessment Summary Tables, EPA, 1992a).

Tetrachloroethene –  $0.002 \text{ (mg/kg/day)}^{-1}$  (Source: Environmental Criteria and Assessment Office, EPA, 1993b).

Trichloroethene – 0.006 (mg/kg/day)<sup>-1</sup> (Source: Environmental Criteria and Assessment Office, EPA, 1993b).

1,2-Dichloroethane – 0.091 (mg/kg/day)<sup>-1</sup> (Source: Integrated Risk Information System (IRIS), EPA, 1993a).

Methylene Chloride – 0.002 (mg/kg/day)<sup>-1</sup> (Source: Integrated Risk Information System (IRIS), EPA, 1993a).

1,1,2-Trichloroethane – 0.056 (mg/kg/day)<sup>-1</sup> (Source: Integrated Risk Information System (IRIS), EPA, 1993a).

At this time, slope factors are not available for the dermal route of exposure. The preliminary risk assessment did not quantitatively estimate dermal absorption from household water use because of the uncertainty associated with making a quantitative estimate of such exposure.

In addition to their classification as carcinogens, five of the carcinogenic COPCs have toxicity data indicating their potential for adverse noncarcinogenic effects in humans. The chronic toxicity data available for these compounds have been used to develop oral reference doses (RfDs). The oral RfDs for these compounds are:

Tetrachloroethene – 0.01 (mg/kg/day) (Source: Integrated Risk Information System (IRIS), EPA, 1993a).

Trichloroethene – 0.006 (mg/kg/day) (Source: Environmental Criteria and Assessment Office, EPA, 1993b).

Methylene Chloride – 0.06 (mg/kg/day) (Source: Integrated Risk Information System (IRIS), EPA, 1993a).

1,1,2-Trichloroethane – 0.004 (mg/kg/day) (Source: Integrated Risk Information System (IRIS), EPA, 1993a).

1,4-dichlorobenzene is also considered to have noncarcinogenic effects via inhalation. The inhalation reference dose for 1,4-dichlorobenzene is 0.2 milligrams per kilogram per day (mg/kg/day) (HEAST).

Chronic toxicity testing has also established that 1,1-dichloroethene, 1,2-dichloroethene, 1,1,1-trichloroethane, and 2-propanone have noncancer endpoints that primarily affect the liver. The oral RfDs for these compounds are:

1,1-Dichloroethene – 0.009 (mg/kg/day) (Source: Integrated Risk Information System (IRIS), EPA, 1993a).

1,2-Dichloroethene – 0.009 (mg/kg/day) (Source: Health Effects Assessment Summary Tables, EPA, 1992).

1,1,1-Trichloroethane – 0.09 (mg/kg/day) (Source: Health Effects Assessment Summary Tables, EPA, 1992).

2-Propanone – 0.10 (mg/kg/day) (Source: Integrated Risk Information System (IRIS), EPA, 1993a).

## 7.4 Risk Characterization Summary

This section presents the results of the evaluation of the potential risks to human health associated with exposure to contaminated ground water at the PVOU. Exposure scenarios are evaluated by estimating the noncarcinogenic and carcinogenic risks associated with them.

The potential for carcinogenic effects is evaluated by estimating the excess lifetime cancer risk, which is the probability of developing cancer during one's lifetime over the background probability of developing cancer (i.e., if no exposure to site contaminants occurred). These risks are probabilities that usually are expressed in scientific notation (e.g.,  $1 \times 10^{-6}$ ). An excess lifetime cancer risk of  $1 \times 10^{-6}$  indicates that an individual has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. EPA uses an excess lifetime cancer risk of  $1 \times 10^{-6}$  as an acceptable incremental cancer risk above background, and an excess lifetime cancer risk of one in ten thousand ( $1 \times 10^{-4}$ ) as the point at which action is generally warranted at a site (EPA, 1991c), thus creating EPA's generally acceptable risk range of  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ .

Noncarcinogenic risk is assessed by comparing the estimated daily intake of a chemical to its RfD. An RfD represents a level that an individual may be exposed to without any adverse effects. The comparison is expressed as a hazard quotient (HQ). An HQ less than one indicates that noncarcinogenic effects from exposure to that chemical are unlikely. HQs for all chemicals of concern that affect the same target organ are added to generate the Hazard Index (HI). An HI less than one indicates that noncarcinogenic effects from all the contaminants are unlikely. Conversely, an HI greater than one indicates that site-related exposures may present a risk to human health.

The results of the baseline risk assessment indicate that the potential for a future resident to be exposed to ground-water contamination through domestic use resulted in a total estimated incremental lifetime cancer risk greater than one person in one thousand ( $1 \times 10^{-3}$ ). This risk exceeds the acceptable risk range and therefore indicates action at the site is warranted.

**Exposure of Residents to Ground Water Through Domestic Use.** Tables 2 and 3 present the Estimated Noncancer Hazard Index and Total Excess Lifetime Cancer Risk, respectively, from domestic use of ground water. To assess potential current residential exposure to ground water through domestic use, all active production wells sampled in 1991 and 1992 that had detections for VOCs were evaluated. These wells include production wells 08000077, 98000068, and 98000108. The estimated HI is less than one for both the average and Reasonable Maximum Exposure (RME) scenarios for these three production wells. The estimated excess lifetime cancer risk for both the average and RME exposure scenarios are below or within EPA's  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$  acceptable risk range.

To assess potential future exposure to contamination in ground water through domestic use, the preliminary risk assessment focused on the eight areas within the PVOU that have ground-water concentrations exceeding 10 times the MCLs. Potential future residential exposures were evaluated based on well groups sampled in 1991 and 1992 within the eight areas. The estimated hazard index for the average ingestion and inhalation exposure scenario ranges from 0.4 in well group 8 to 40 for ingestion and 30 for inhalation in well

group 3. The RME ingestion and inhalation exposure scenario ranges from 0.5 in well group 8 to 60 in well group 3. Both average and RME exposure scenarios exceed the hazard index of 1 (and hazard quotient of 1) for well groups 3 and 5, suggesting that exposure may present a risk to human health.

The estimated excess lifetime cancer risk for the average exposure scenario exceeds EPA's acceptable risk range in well groups 3, 4, and 5. The estimated excess lifetime cancer risk for the average ingestion exposure scenario ranges from  $4 \times 10^{-6}$  in well group 1 to  $4 \times 10^{-4}$  in well group 5. For the average inhalation scenario, the estimated excess lifetime cancer risk ranges from  $7 \times 10^{-7}$  in well group 1 to  $2 \times 10^{-4}$  in well group 5.

The RME exposure scenarios exceeded EPA's acceptable risk range for well groups 2, 3, 4, 5, 6, and 7. The RME ingestion scenario excess cancer risk ranged from  $1 \times 10^{-5}$  in well group 1 to  $3 \times 10^{-3}$  in well group 5. RME inhalation risks ranged from  $2 \times 10^{-6}$  in well group 1 to  $2 \times 10^{-3}$  in well group 5.

Additionally, exposure to 1,1-dichloroethene in ground water was evaluated using the modified RfD/cancer ratio approach that EPA Regional IX and the Office of Drinking Water recommend. The modified RfD approach is recommended on a chemical-by-chemical basis for certain group C chemicals (e.g., 1,1-dichloroethene) that have limited evidence of carcinogenicity. Because of this limited evidence, the modified RfD approach utilizes the risk assessment protocols for compounds with noncancer effects, but modifies the protocol by adding a safety factor of 10 to be health-protective. Using the modified RfD approach, the estimated ratio for potential current residential exposures ranges from 0.2 to 2. These estimates are health-protective because they do not consider treatment or blending of contaminated water with clean water, and incorporate a safety factor. For potential future residential exposure to 1,1-dichloroethene in ground water, the cancer ratio is greater than one for all well groups except well groups 4 and 6. Although ratios greater than 1 suggest possible cancer concerns, there is very limited evidence that this contaminant is carcinogenic in humans or animals.

**Exposure of Workers and Residents to Contaminants in Ground Water Through the Transport of VOCs from Ground Water Through the Foundation of a Building.** A screening assessment was used to quantitatively evaluate potential risk to current workers and futures workers and residents as a result of exposure to contaminants in ground water through the transport of VOCs from ground water through the foundation of a building. Five chemicals were evaluated in this assessment: 1,2-dichloroethane, 1,1-dichloroethene, methylene chloride, tetrachloroethene, and trichloroethene. The estimated hazard quotient was less than one for both the residential and worker exposure scenarios. The estimated excess lifetime cancer risk was below or within EPA's acceptable risk range.

**Exposure of Vegetation and Wildlife to Contaminants in Surface Water.** Eight VOCs were detected in surface water in the San Jose Creek. Potential environmental receptors include vegetation and wildlife exposed to surface water in this area. The detected VOCs will be removed from water primarily by volatilization to the atmosphere. These VOCs are not expected to significantly bioconcentrate in aquatic organisms or adsorb to sediment. A comparison of concentrations detected in surface water to the corresponding chemical-specific acute and chronic Ambient Water Quality Criteria shows that the criteria are

considerably higher than the detected concentrations. Therefore, no adverse impact to aquatic organisms is predicted.

Based on this risk characterization summary, actual or threatened releases of hazardous substances at this site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to public health, welfare, or the environment.

## 8 Description of Remedial Alternatives

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EPA's Remedial Action Objectives (RAOs) for the PVOU are to:

- Prevent exposure of the public to contaminated ground water
- Inhibit contaminant migration from the more highly contaminated portions of the aquifer to the less contaminated areas or depths
- Reduce the impact of continued contaminant migration on downgradient water supply wells
- Protect future uses of less contaminated and uncontaminated areas

The RAOs reflect EPA's regulatory goal of restoring usable ground waters to their beneficial uses wherever practicable, within a time frame that is reasonable; or, if restoration is deemed impracticable, to prevent further migration of the plume, prevent exposure to the contaminated ground water, and evaluate further risk reduction (40 CFR Section 300.430(a)(1)(iii)(F)).

The RAOs for the PVOU do not include numeric, chemical-specific objectives in the aquifer or a time frame for restoration because this is an interim action. They do include VOC "mass removal" as a secondary objective. EPA's selected alternative will remove significant contaminant mass from the aquifer, in effect beginning the restoration process, but it will be designed for migration control rather than mass removal.

Four alternatives were evaluated in the FS for the PVOU:

- Alternative 1 - No Action
- Alternative 2 - Ground-water Monitoring
- Alternative 3 - Ground-water Control in the Shallow and Intermediate Zones at the Mouth of the Valley
- Alternative 4 - Ground-water Control in the Shallow and Intermediate Zones at the Mouth of the Valley and in the Intermediate Zone at Mid-Valley

A brief description of each of the four remedial alternatives is presented below.

### 8.1 Alternative 1 - No Action

The NCP requires a no-action alternative to provide a baseline for comparison to other alternatives. In this no-action alternative, no remedial actions are taken to control migration from or within the Puente Valley area. This alternative does not include any ground-water monitoring, extraction, or treatment, nor does it consider other ongoing activities that are not part of a CERCLA remedy that may or may not continue into the future. Ground-water

extraction at water supply wells is considered as part of background conditions in the PVOU area and, therefore, would continue to occur under Alternative 1.

## **8.2 Alternative 2 - Ground-water Monitoring**

The only remedial action incorporated into Alternative 2 is ground-water monitoring to monitor compliance with RAOs and performance criteria in the shallow, intermediate, and deep zones at mid-valley and the mouth of the valley. Alternative 2 does not have any extraction, treatment, conveyance, or discharge components (other than the same background pumping considered in Alternative 1) and, therefore, does not address contaminant migration.

### **Monitoring**

For cost estimation and evaluation of the alternative, it was assumed that 16 new monitoring wells would be installed: 4 new wells downgradient of mid-valley in the intermediate and deep zones, and 12 new wells near the mouth of the valley in the shallow and intermediate zones.

## **8.3 Alternative 3 - Ground-water Control in the Shallow and Intermediate Zones at the Mouth of the Valley**

Alternative 3 is containment of contaminated ground water in the shallow and intermediate zones at the mouth of the valley. For the purposes of cost estimation and evaluation, extraction and treatment systems were assumed to be implemented, though the actual remedy may differ. The remedy implemented will need to meet the performance criteria specified in Section 10 this ROD. Components of this alternative are as follows.

### **Extraction**

The ground-water extraction in Alternative 3 includes four wells in each zone (shallow and intermediate). The total extraction rates from the shallow and intermediate zones are 700 and 1,000 gallons per minute (gpm), respectively, for a total flow of 1,700 gpm. The actual extraction well locations and rates will be determined during remedial design based on additional evaluation of the extent of contamination during the remedial design investigation.

### **Treatment**

Extracted ground water will be treated by either air stripping with offgas treatment or liquid-phase carbon adsorption to remove VOCs prior to discharge. For cost estimation purposes, this alternative assumes a treatment system using air stripping with adsorption of VOCs in offgas. Construction of a single 1,700-gpm, centralized treatment plant near the mouth extraction system is assumed for this alternative.

If water is discharged to a municipal water supply system, treatment to reduce concentrations of total dissolved solids (TDS) and nitrate would probably be required for shallow ground water. The assumed level of treatment for inorganic constituents, if

required, would be to the MCL or secondary drinking water standard, as applicable. In the FS, a membrane separation process was assumed for discharge to a municipal water supply system.

### **Conveyance**

Treated ground water may be discharged to Puente Creek or other surface waters or provided to a municipal supply system. Preliminary evaluations that PVSC conducted indicate that there are nearby water distribution systems operated by San Gabriel Valley Water Company, Suburban Water Systems, and the City of Industry. These purveyors have indicated that the water demands for any of these nearby systems substantially exceed the ground-water extraction rate assumed for this alternative.

### **Discharge**

As described above, treated water may be either discharged to surface waters or to a water supply line for municipal use.

### **Monitoring**

Alternative 3 also includes a monitoring system to ensure compliance with RAOs and performance criteria in the shallow, intermediate, and deep zones at mid-valley and the mouth of the valley. In addition, selected monitoring wells may provide an early warning system for extraction and treatment systems. A total of 12 new wells was assumed: 4 new wells downgradient of mid-valley in the intermediate and deep zones, and 8 new wells near the mouth of the valley in the shallow and intermediate zones. Implementation of this monitoring program during the initial stages of the remedial design will help to define design parameters.

## **8.4 Alternative 4 - Ground-water Control in the Shallow and Intermediate Zones at the Mouth of the Valley and in the Intermediate Zone at Mid-Valley**

Alternative 4 includes all of the components described for Alternative 3, plus ground-water extraction and treatment components in the intermediate zone at mid-valley. The additional extraction is intended to address migration of contamination in the intermediate zones. The remedial action components described below have been defined only for the purposes of cost estimation and evaluation. If Alternative 4 is selected, the actual remedy implemented will need to meet the performance criteria identified in this ROD, and could therefore have different components than those assumed for the FS.

### **Extraction**

As stated above, Alternative 4 includes the same mouth of the valley pumping system as described for Alternative 3. Installation of four extraction wells (screened from 200 to 250 feet below ground surface (bgs)) has been assumed along the west side of Hacienda Boulevard, with one well south of San Jose Creek and three wells north of the creek. Three of the wells have an extraction rate of 150 gpm each. The fourth well provides an extraction

rate of 100 gpm, yielding a total extraction rate of 550 gpm from the intermediate zone at mid-valley.

### **Treatment**

Alternative 4 includes the same treatment processes and mouth of the valley treatment plant described for Alternative 3. Alternative 4 assumes that a separate, 550-gpm, mid-valley treatment plant will be built to treat ground water extracted from the mid-valley system. If it appears to be more cost-effective, a single treatment plant system could be designed to treat water extracted from both the mouth of the valley and mid-valley systems. If discharge to San Jose Creek is selected as the discharge option, a treatment plant located closer to San Jose Creek would reduce treated water conveyance costs.

### **Conveyance**

The conveyance system includes untreated water pipelines from the extraction wells to the treatment plant and treated water pipeline alignments to the San Jose Creek and potential connection points to municipal water supply system lines. Several potential connection points to water supply systems exist in the treatment plant vicinity. Suburban Water Systems has a 16-inch-diameter pipeline adjacent to Hacienda Boulevard. The City of Industry operates a 16-inch-diameter pipeline adjacent to Valley Boulevard. The San Gabriel Valley Water Company operates a 14-inch pipeline that extends along the south side of San Jose Creek, and also has a 12-inch-diameter pipeline along Valley Boulevard west of Proctor Avenue. Discharge to nearby San Jose Creek is also an option.

### **Discharge**

As discussed above, water may be either discharged to surface waters or to a water supply line for municipal use.

### **Monitoring**

Alternative 4 includes the monitoring system to monitor compliance with RAOs and performance criteria in the shallow, intermediate, and deep zones at mid-valley and the mouth of the valley. A total of 13 new wells is assumed: 5 new wells in the mid-valley area (intermediate and deep zones) and 8 new wells near the mouth of the valley (shallow and intermediate zones). Implementation of this monitoring program during the initial stages of the remedial design will help to define design parameters.

## 9 Summary of Comparative Analysis of Alternatives

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The four remedial alternatives described in Section 8 are compared to the Superfund nine evaluation criteria listed in 40 CFR Section 300.430. The comparative analysis provides the basis for determining which alternative presents the best balance of the criteria. The first two evaluation criteria are considered *threshold criteria* that the selected remedial action must meet. The five *primary balancing criteria* are balanced to achieve the best overall solution. The two *modifying criteria*, state and community acceptance, are also considered in remedy selection.

### Threshold Criteria

- **Overall Protection of Human Health and the Environment** addresses whether each alternative provides adequate protection of human health and the environment, and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, and/or institutional controls.
- **Compliance with ARARs** addresses the requirement of Section 121(d) of CERCLA that remedial actions at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations, which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4).

### Primary Balancing Criteria

- **Long-term Effectiveness and Permanence** refers to the ability of a remedy to maintain reliable protection of human health and the environment over time.
- **Reduction of Toxicity, Mobility, or Volume Through Treatment** refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.
- **Short-term Effectiveness** addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers and the community during construction and operation of the remedy until cleanup goals are achieved.
- **Implementability** addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.
- **Cost** evaluates the estimated capital, operation and maintenance (O&M), and indirect costs of each alternative in comparison to other equally protective alternatives.

## Modifying Criteria

- **State Acceptance** indicates whether the state agrees with, opposes, or has concerns about the preferred alternative.
- **Community Acceptance** includes determining which components of the alternatives interested persons in the community support, have reservations about, or oppose.

This section describes each threshold and primary balancing criterion, evaluates each alternative in relation to each criterion, and identifies advantages and disadvantages among the alternatives in relation to each criterion. Figure 4 presents a comparative matrix in which the four alternatives are ranked for each of the evaluation criterion. The details of how the rankings have been assigned for each criterion are provided below.

## 9.1 Overall Protection of Human Health and the Environment

The NCP requires that all alternatives be assessed to determine whether they can adequately protect human health and the environment from unacceptable risks from site contamination. These risks can be mitigated by eliminating, reducing, or controlling exposure to hazardous substances, pollutants, or contaminants.

### 9.1.1 Overall Protection of Human Health and the Environment: Evaluation of Alternatives

Alternatives 1 and 2 do not provide protection of human health and the environment. These two alternatives allow migration of VOC contamination to continue. Alternative 2 would include ground-water monitoring to provide early warning of expected increases in contaminant concentrations that may interfere with the ability of area water purveyors to supply ground water meeting MCLs.

Alternatives 3 and 4 provide protection of human health and the environment by inhibiting contaminant migration, thereby protecting future uses of less contaminated and uncontaminated ground water. Alternatives 3 and 4 would also reduce the toxicity, mobility, and volume of the contaminants and remove significant contaminant mass from the aquifer. Alternative 4 includes additional extraction in the mid-valley intermediate zone that is not assumed in Alternative 3. This extraction would provide additional protection for the intermediate and deep zone downgradient of mid-valley and remove additional contaminant mass.

Alternatives 1 and 2 are assigned low rankings in Figure 4 because they fail to provide migration control. Alternatives 3 and 4 are assigned high rankings because they meet this threshold requirement of protecting human health and the environment. Alternative 4 is ranked slightly higher than Alternative 3 because of the additional migration control and mass removal at mid-valley.

## 9.2 Compliance with ARARs

This evaluation criterion is also a threshold requirement and is used to determine if each alternative would attain federal and state ARARs, or whether there is adequate justification for invoking waivers for specific ARARs.

### 9.2.1 Compliance with ARARs: Evaluation of Alternatives

Alternatives 1 and 2 do not meet ARARs. Both alternatives allow for continued uncontrolled migration of contaminants, at levels exceeding MCLs, into production wells located at the mouth of Puente Valley. Neither alternative ensures that water produced from these wells will meet drinking water ARARs. The continued migration of contaminants under Alternatives 1 and 2 would not meet the chemical-specific ARARs established for the uncontaminated ground water in the intermediate zone.

Alternatives 3 and 4 meet the ARARs described in Section 11 of this ROD. Both of the retained treatment technologies are technically capable of meeting ARARs for VOCs in the extracted ground water. Since this is an interim remedial action to contain contamination, EPA has not established chemical-specific ARARs for the contaminated portions of the aquifer.

Alternatives 1 and 2 are assigned low rankings because they do not meet this threshold requirement of complying with ARARs. Alternatives 3 and 4 are assigned high rankings because they do comply with ARARs. There are no significant differences in the ability of Alternatives 3 and 4 to comply with ARARs.

## 9.3 Long-Term Effectiveness

This evaluation criterion assesses the extent to which each remedial alternative reduces risk after the remedial action objectives are met. Residual risk can result from exposure to untreated waste or treatment residuals. The magnitude of the risk depends on the magnitude of the wastes and the adequacy and reliability of controls, if any, that are used to manage untreated waste and treatment residuals. For this interim action, untreated waste refers to any contaminated ground water not removed from the aquifer.

The performance of the alternatives in relation to this criterion is evaluated primarily by estimating the extent to which each alternative prevents the migration of contamination into less contaminated and uncontaminated areas. Preventing or reducing contaminant migration reduces contaminant concentrations in downgradient areas, reducing risk by reducing the likelihood of exposure. Performance was evaluated using ground-water modelling. Because this is an interim remedy to contain contaminant migration, untreated wastes will remain in the ground water.

### 9.3.1 Long-Term Effectiveness and Permanence: Evaluation of Alternatives

Ground-water modelling results presented in the FS suggest Alternatives 1 and 2 do not contain contaminant migration in either the shallow or intermediate zones in the PVOU. Alternatives 3 and 4 are effective at containing migration of contamination at the mouth of the valley in the shallow and intermediate zones. Modelling results indicate that only

Alternative 4 is effective at containing intermediate zone migration at mid-valley, although Alternative 3 provides a measure of protection by containing contamination in the intermediate zone at the mouth of the valley.

Alternatives 1 and 2 do not prevent contaminant migration in either the shallow or the intermediate zones and, therefore, are assigned a low ranking in Figure 4 because they do not provide significant long-term effectiveness and permanence. Alternatives 3 and 4 are assigned a high ranking because they do contain contaminant migration. Alternative 4 is ranked slightly higher than Alternative 3 because of the additional contaminant migration control provided at mid-valley.

## 9.4 Reduction of Toxicity, Mobility, and Volume Through Treatment

This criterion addresses the preference, as stated in the NCP, for selecting remedial actions employing treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as a principal element of the action. This preference is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.

This evaluation focuses on the following factors for each remedial alternative:

- Whether the alternative satisfies the statutory preference for treatment as a principal element
- The treatment process employed, including the amount of hazardous materials that will be destroyed or treated and the degree of expected reduction in toxicity, mobility, or volume
- The degree to which treatment is irreversible
- The type and quantity of treatment residuals that will remain following treatment

### 9.4.1 Reduction of Toxicity, Mobility, or Volume Through Treatment: Evaluation of Alternatives

Alternatives 1 and 2 do not provide any reduction in toxicity, mobility, or volume and do not satisfy the statutory preference for treatment. Alternatives 3 and 4 satisfy the statutory preference for treatment. Both of these alternatives would significantly reduce the volume and mobility of contamination by inhibiting further contaminant migration. The two treatment technologies retained for Alternatives 3 and 4, air stripping with offgas controls and liquid-phase carbon adsorption, would irreversibly reduce the toxicity and volume of contaminants in the extracted ground water and result in an effluent stream that meets drinking water standards for VOCs. Both treatment technologies would result in the destruction of VOCs if the granular activated carbon is regenerated. These technologies would create residuals if used carbon is not regenerated.

Alternative 3 is estimated to provide removal of 15,200 pounds of VOCs over a 30-year period of operation. Alternative 4 is estimated to provide removal of 25,000 pounds of VOCs over a 30-year period of operation. The increase in mass removal for Alternative 4 over Alternative 3 is estimated to be 9,800 pounds. The actual operation of the extraction and treatment systems in Alternatives 3 and 4 could yield lower or higher values.

Alternatives 1 and 2 are assigned a low ranking in Figure 4 because they do not satisfy the statutory preference for treatment and do not reduce the toxicity, mobility, or volume of contaminants. Alternatives 3 and 4 are assigned a high ranking because they do satisfy the statutory preference for treatment and significantly reduce the toxicity, mobility, and volume of contaminants by inhibiting contaminant migration and producing an effluent stream that meets MCLs. Alternative 4 is ranked slightly higher because of the additional contaminant migration control and mass removal in the mid-valley area incorporated into this alternative.

## 9.5 Short-Term Effectiveness

This criterion evaluates the effects of each remedial alternative on human health and the environment during the construction and implementation phase until remedial action objectives are met. The following factors are addressed for each alternative:

- **Protection of workers and the community during construction and implementation phases.** This factor qualitatively examines risk that results from implementation of the proposed remedial action and the effectiveness and reliability of protective measures.
- **Environmental impacts.** This factor addresses the potential adverse environmental impacts that may result from the construction and implementation of an alternative. This factor also evaluates the reliability of the available mitigation measures to prevent or reduce potential impacts.
- **Time until RAOs are achieved.**

### 9.5.1 Short-Term Effectiveness: Evaluation of Alternatives

Alternative 1 is not evaluated for this criterion because there is no construction or implementation phase. None of the alternatives pose unmitigable risks to the community during construction and implementation. Nor do any of the alternatives pose unmitigable risks to workers beyond general construction hazards associated with large construction projects. No unmitigable negative environmental impacts are anticipated in the areas in which facilities would be constructed.

For Alternative 2, the RAOs would not be met as long as contaminant migration continues. Additional investigation is required to assess the current magnitude of contaminant migration in portions of the PVOU area. However, the modelling for Alternatives 1 and 2 suggests that contaminant migration is likely to continue for a considerable length of time. The RAOs would be met for Alternatives 3 and 4 as soon as the ground-water extraction and treatment components begin operation.

The time until RAOs are achieved (i.e., system startup) for Alternatives 3 and 4 is anticipated to be within approximately 3 to 5 years. However, there are several

implementability issues (described in Section 9.6) that could impact this time. In addition, implementation of these alternatives could be complicated by the need to obtain sites for remedy components (wells and treatment facilities) and the need to construct conveyance systems in heavily developed areas. Ground-water treatment may create hazardous waste residuals (e.g., spent carbon).

Alternatives 3 and 4 are assigned a high ranking because there are no unmitigable risks to the community, workers, or the environment during construction and implementation. There are no significant differences between the two alternatives, although Alternative 4 will likely take slightly longer to meet RAOs because of the additional construction at mid-valley. Although there are no unmitigable risks associated with construction and implementation of Alternative 2 and there is less overall construction, Alternative 2 is assigned a medium ranking because RAOs are never achieved.

## 9.6 Implementability

This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation. The following factors are considered:

- Technical Feasibility
  - Ability to construct and operate: addresses any technical difficulties and unknowns associated with construction or operation of the technology
  - Reliability of technology: focuses on the likelihood that technical problems associated with implementation will lead to schedule delays
  - Ease of undertaking additional remedial action: includes a discussion of what, if any, future remedial actions may need to be undertaken and how the remedial action would interfere with, or facilitate, the implementation of future actions
- Administrative Feasibility
  - Coordination with other agencies, including the need for agreements with parties other than EPA required for construction and operation of the remedy
- Availability of Services and Materials
  - Availability of necessary equipment, specialists, and provisions to assure any necessary resources
  - Availability of services and materials, plus the potential for obtaining competitive bids

### 9.6.1 Implementability: Evaluation of Alternatives

Alternative 1 is not evaluated for this criterion because no action is implemented. As described above, the implementability evaluation incorporates several factors. Each of these is discussed separately in the following text.

**Technical Feasibility: Ability to Construct and Operate.** The extraction, treatment, and conveyance technologies included in Alternatives 3 and 4 and the monitoring technologies included in all three remedial action alternatives are widely used. No significant difficulties are expected in construction and operation of these technologies.

**Technical Feasibility: Reliability of Technology.** The extraction, treatment, conveyance, and monitoring technologies in Alternatives 2, 3, and 4 are generally known to be proven and reliable.

**Technical Feasibility: Ease of Undertaking Additional Remedial Actions.** The alternatives would not interfere with the implementation of future response actions to further contain contamination or restore ground water in the PVOU area.

**Administrative Feasibility.** There are not likely to be any significant administrative feasibility issues associated with implementation of Alternative 2, other than obtaining access agreements for monitoring well installation. Implementation of Alternatives 3 and 4 would require acquisition of property and/or easements for the construction of extraction wells, treatment facilities, and conveyance facilities.

In addition, implementing Alternatives 3 or 4 would require resolution of the following administrative issues associated with ground-water extraction and discharge of treated water to local water purveyors or to the Puente Creek:

- Agreements would need to be made with the Watermaster or with a water purveyor to account for extraction from the basin by the parties implementing the selected remedy because these parties do not have water rights.
- Agreements would need to be reached with water purveyors that would receive treated water from the ground-water treatment facilities specifying the amount of water each purveyor would accept; the treated water delivery location; responsibility for any necessary capital improvements to purveyor systems; and to determine operational, liability, financial, and other arrangements.
- Water purveyors would need to obtain approval for modifications to their water supply permits.

**Availability of Services and Materials.** Implementation of Alternatives 3 and 4 would require fabrication of treatment plant equipment. Required services and materials are believed to be available, including qualified contractors for construction and operation of the necessary facilities.

Alternative 2 is assigned a high ranking in Figure 4 because there are no significant issues that could impact implementability of this monitoring-only alternative. Alternatives 3 and 4 are assigned a medium ranking because of the administrative issues associated with ground-water extraction and treated water discharge. Because the anticipated flow rates are not high (less than 2,500 gpm), it is expected that these administrative issues will not result in extensive delays in project implementation.

The technical feasibility of Alternatives 3 and 4 is similar, although the more complex conveyance and treatment facilities required in Alternative 4 are more likely to lead to schedule delays.

## 9.7 Cost

This criterion addresses the total cost of each alternative. This includes short- and long-term costs, and capital and O&M costs. The following cost elements are considered for each alternative:

- **Capital Cost.** Direct capital cost includes the cost of construction, labor, equipment, land, site development, and service. Indirect capital cost includes engineering fees, license and permit cost, startup and shakedown costs, and contingencies.
- **O&M Cost.** Annual O&M cost includes operating labor cost, maintenance materials and labor, pumping and treatment energy costs, monitoring costs, and all other postconstruction costs necessary to ensure continuous effective operation of the alternative.
- **Total Present Worth.** The total present worth of each alternative is calculated at an interest rate of 5 percent and a time period of 30 years. Total present worth for each alternative includes capital cost plus the present worth of the annual O&M costs.
- **Cost per Pound of Mass Removed.** The cost per pound of VOC mass removed is calculated for each alternative that includes ground-water extraction and treatment.

The cost estimates are considered order-of-magnitude level estimates (i.e., the cost estimates have an expected accuracy of +50 to -30 percent). The assumption of a 30-year operating period is based on EPA guidance and does not reflect any specific finding regarding the duration of the remedy.

### 9.7.1 Cost: Evaluation of Alternatives

Although there is no cost presented for the no-action alternative (Alternative 1), there have been and would continue to be substantial financial impacts on local water purveyors or their rate payers because of the continued migration of contamination to their production wells. Table 4 summarizes the estimated costs for Alternatives 2 through 4, respectively.

### 9.7.2 Cost: Comparison of Alternatives

Table 4 compares the cost of each alternative for capital costs, long-term O&M costs, and present worth. The short-term capital costs range from \$2,344,000 for Alternative 2 to \$11,751,000 for Alternative 4. The annual O&M costs range from \$360,000 for Alternative 2 to \$1,634,000 for Alternative 4.

## 9.8 State Acceptance

The State of California has provided comments and feedback to EPA throughout the RI/FS process for the PVOU. In a letter dated September 24, 1998, the California Department of Toxic Substance Control (DTSC), as lead agency for the state, concurred with EPA's selected remedy. In addition, the RWQCB approved EPA's selected remedy at a meeting held on September 14, 1998.

## 9.9 Community Acceptance

EPA received written comments from three individuals and several organizations or agencies on the Proposed Plan for this interim action at the PVOU. In addition, EPA received limited oral comments and questions at the public meeting held in January 1998 to discuss EPA's plans. EPA responded directly to the oral questions and comments at the public meeting. The entire transcript for the public meeting is included in the Responsiveness Summary in Part II of this ROD (Volume 2). All of the written comments, along with EPA's responses to them, are also presented in the Responsiveness Summary.

Several commenters expressed support for EPA's proposed remedy. Some commenters did not believe that the remedy was necessary or supported by the information that has been collected to date. EPA has determined that the preferred alternative presented in the Proposed Plan represents the most appropriate remedy for the ROD site. None of the comments received suggested a change to the overall remedy that EPA selected.

## 10 Selected Remedy

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After considering CERCLA's statutory requirements, the detailed comparison of the alternatives using the nine criteria, and public comments, EPA, in consultation with the State of California, has determined that the most appropriate remedy for this site is Alternative 3: ground-water control in the shallow and intermediate zones at the mouth of Puente Valley. This alternative meets the two NCP threshold evaluation criteria; overall protection of human health and the environment and compliance with ARARs, and provides the best balance of the remaining Superfund evaluation criteria. EPA expects that this interim remedy will provide the basis for the final remedy for the PVOU.

Alternative 3 will be implemented using a performance-based approach. The performance-based approach specifies criteria ("performance criteria") that must be met while allowing flexibility in implementation. The performance criteria are designed to attain the RAOs for the PVOU and are described below.

### 10.1 Performance Criteria

#### **Performance Criterion for the Shallow Zone:**

*The remedial action shall prevent ground water in the shallow zone with VOC contamination above 10 times the ARARs listed in Table 1 from migrating beyond its current lateral and vertical extent as described in the RI/FS for the PVOU.*

Compliance with this criterion will be monitored at wells described as follows:

- Located laterally and vertically downgradient of contamination exceeding 10 times the relevant ARAR, but within areas in which there is detectable VOC contamination in the shallow zone
- Completed with screen lengths generally of 20 feet or less between the water table and 150 feet bgs. Longer screened intervals may be appropriate in limited situations and will be evaluated on a case-by-case basis

Extracted ground water will be treated by air stripping (with off-gas controls) or liquid-phase carbon adsorption. If alternative treatment technologies are identified, EPA will evaluate the alternative technologies in accordance with the criteria specified in 40 CFR Section 300.430 during remedial design.

#### **Performance Criterion for the Intermediate Zone**

*The remedial action shall provide sufficient hydraulic control to prevent ground water in the intermediate zone with VOC contamination above ARARs listed in Table 1 from migrating beyond the B7 Well Field Area. The B7 Well Field Area is defined as the area encompassed by (1) the wells listed in Table 5 and (2) the current downgradient extent of contamination above ARARs in the intermediate zone, in the vicinity of the wells located in Table 5.*

Compliance with this criterion will be monitored at compliance wells described as follows:

- Located within 2,000 feet of either (1) the current extent of ground water contaminated with any VOC exceeding its ARAR or (2) a production well listed in Table 5, whichever represents the nearest margin of the B7 Well Field Area
- Located along the northern, northwestern, and western margins of the B7 Well Field Area
- Completed with screen lengths of 20 feet or less within the intermediate zone. Larger screened intervals may be appropriate in limited situations and will be evaluated on a case-by-case basis
- Extracted ground water will be treated by air stripping (with off-gas controls) or liquid-phase carbon adsorption. If alternative treatment technologies are identified, EPA will evaluate the alternative in accordance with the criteria specified in 40 CFR Section 300.430 during remedial design.

Implementation of the remedial action cannot result in any adverse effects (i.e., increases in migration of contamination) to production wells that are not part of the remedial action. In addition, the remedial action must provide adequate capture of contamination above ARARs without relying on the effects of wells that are not part of the remedial action.

### **Compliance with Performance Criteria**

Compliance with the performance criteria will be confirmed by quarterly sampling at compliance wells. Over time, if it can be demonstrated, based on historical monitoring data, that concentrations are unlikely to exceed the performance criteria in the short term, monitoring intervals may be lengthened. If it appears, based on trends in monitoring data, that concentrations may exceed the performance criteria, monitoring intervals may be shortened.

Concentrations at compliance wells will be used as an absolute criterion to demonstrate compliance. EPA expects that ground-water containment actions will be implemented sufficiently upgradient of these wells to provide enough of a buffer zone to allow additional actions to be taken, if necessary, to ensure compliance. EPA also anticipates that additional monitoring wells will be installed, or existing wells within this buffer zone will be used to provide an early warning system, and therefore provide sufficient time to address and prevent noncompliance.

Imminent exceedence of the performance criteria at compliance wells indicates that ground-water contamination is migrating, and hydraulic containment is required. Any actual or imminent exceedence of the performance criteria at the compliance wells will require ground-water extraction and treatment to achieve hydraulic containment. Actual exceedence of performance criteria at compliance wells will result in the initiation of enforcement actions.

### **Supplemental Explanation of Performance Criteria**

The following paragraphs provide additional explanation of the performance criteria, their meaning and objectives to help clarify the intent of the criteria.

extraction wells immediately upgradient of the compliance wells and downgradient of production wells that are not part of the remedial action. The remedial action must be protective of the environment and not result in adverse effects, either on production wells, or on the overall extent of contamination.

# 11 Applicable or Relevant and Appropriate Requirements (ARARs)

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Section 121(d) of CERCLA, 42 U.S.C. § 9621(d) requires that remedial actions at CERCLA sites attain (or justify the waiver of) any federal or state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate. These applicable or relevant and appropriate requirements are referred to as "ARARs." Federal ARARs may include requirements promulgated under any federal environmental laws. State ARARs may only include promulgated, enforceable environmental or facility-siting laws of general application that are more stringent or broader in scope than federal requirements and that are identified by the state in a timely manner.

An ARAR may be either "applicable," or "relevant and appropriate," but not both. If there is no specific federal or state ARAR for a particular chemical or remedial action, or if the existing ARARs are not considered sufficiently protective, then other guidance or criteria to be considered (TBCs) may be identified and used to ensure the protection of public health and the environment. The NCP, 40 C.F.R. Part 300, defines "applicable," "relevant and appropriate," and "to be considered" as follows:

- **Applicable requirements** are those cleanup standards, standards of control, or other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.
- **Relevant and appropriate requirements** are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and that are more stringent than federal requirements may be relevant and appropriate.
- **TBCs** consist of advisories, criteria, or guidance that EPA, other federal agencies, or states developed that may be useful in developing CERCLA remedies. The TBC values and guidelines may be used as EPA deems appropriate.

ARARs are identified on a site-specific basis from information about the chemicals at the site, the remedial actions contemplated, the physical characteristics of the site, and other appropriate factors. ARARs include only substantive, not administrative, requirements, and pertain only to onsite activities. Offsite activities must comply with all applicable federal,

state, and local laws, including both substantive and administrative requirements, that are in effect when the activity takes place. There are three general categories of ARARs:

- **Chemical-specific ARARs** are health- or risk-based concentration limits, numerical values, or methodologies for various environmental media (i.e., ground water, surface water, air, and soil) that are established for a specific chemical that may be present in a specific media at the site, or that may be discharged to the site during remedial activities. These ARARs set limits on concentrations of specific hazardous substances, pollutants, and contaminants in the environment. Examples of this type of ARAR include state and federal drinking water standards.
- **Location-specific ARARs** set restrictions on certain types of activities based on site characteristics. Federal and state location-specific ARARs are restrictions placed on the concentration of a contaminant or the activities to be conducted because they are in a specific location. Examples of special locations possibly requiring ARARs may include floodplains, wetlands, historic places, and sensitive ecosystems or habitats.
- **Action-specific ARARs** are technology- or activity-based requirements that are triggered by the type of remedial activities under consideration. Examples of this type of ARAR are RCRA regulations for waste treatment, storage, or disposal.

EPA has evaluated and identified the ARARs for the selected remedy in accordance with CERCLA, the NCP, and EPA guidance, including the *CERCLA Compliance with Other Laws Manual, Part I (Interim Final)*, OSWER Directive 9234.1-01 (EPA, 1988a) and *CERCLA Compliance with Other Laws Manual, Part II*, OSWER Directive 9234.1-02 (EPA, 1989).

## 11.1 Chemical-specific ARARs

The chemicals of potential concern for the PVOU are VOCs that were detected in ground water in the PVOU. Table 1 lists these VOCs and their chemical-specific ARARs.

### 11.1.1 Federal Drinking Water Standards

EPA has established MCLs, 40 CFR, Part 141, under the Safe Drinking Water Act (SDWA), 42 U.S.C. §§ 300f-j, to protect public health from contaminants that may be found in drinking water sources. MCLs are applicable at the tap for water that is delivered directly to 25 or more people or to 15 or more service connections.

Under the SDWA, EPA has also designated Maximum Contaminant Level Goals (MCLGs), 40 C.F.R. Part 141, which are health-based goals that may be more stringent than MCLs. MCLGs are set at levels, including an adequate margin of safety, where no known or anticipated adverse health effects would occur. MCLGs greater than zero are relevant and appropriate where multiple contaminants in ground water or multiple pathways of exposure present unacceptable health risks (EPA, 1988b). One chemical detected in the PVOU ground water, 1,1,2-trichloroethane, has an MCLG that is more stringent than its MCL.

Under Section 300.430(f)(5) of the NCP, remedial actions must generally attain MCLs and nonzero MCLGs if the contaminated water is a current or potential source of drinking water. The 1995 Water Quality Control Plan for the Los Angeles Region (Basin Plan)

designates all of the contaminated ground water in the PVOU as current and potential sources of drinking water. However, since this ROD selects an interim remedial action to contain contaminant migration, no final cleanup standards are established for the restoration of ground water. Final cleanup standards will be established in a Final ROD. For this Interim ROD, EPA has determined that the federal MCLs and nonzero MCLGs listed in Table 1 are ARARs for any ground water that is treated and used for domestic, municipal, industrial, or agricultural purposes, and for any ground water that is discharged to the environment. In addition, these MCLs and MCLGs are ARARs for currently uncontaminated ground water in the intermediate zone downgradient from the B7 Well Field Area (EPA, 1988a).

If treated ground water is to be delivered into a public water supply, all legal requirements for drinking water in existence at the time that the water is served will have to be met because EPA considers the service of water to the public to be an offsite activity.

### **11.1.2 California Drinking Water Standards**

California has established state MCLs for sources of public drinking water, under the California Safe Drinking Water Act of 1976, Health and Safety Code (H&SC) §§ 4010.1 and 4026(c), California Code of Regulations (CCR) Title 22, §§ 64431 and 64444. Some state MCLs are more stringent than the corresponding federal MCLs. EPA has determined that the more stringent state MCLs are relevant and appropriate for the PVOU. There are also some chemicals that lack federal MCLs. Where state MCLs exist for chemicals that lack federal MCLs, EPA has determined that the state MCLs are relevant and appropriate for the PVOU. State MCLs apply to remedial actions in the PVOU in the same manner as federal MCLs. Table 1 identifies the state MCLs that are ARARs for this remedial action.

## **11.2 Location-specific ARARs**

This ROD specifies performance criteria for the remedy. As such, the locations of remediation facilities (e.g., wells, treatment plant, and pipelines) are not specifically identified herein. Locations of remediation facilities will be determined during the remedial design, and will conform to the location-specific ARARs identified below.

### **11.2.1 Location Standards for TSD Facilities**

California Code of Regulations, Title 22, Section 66264.18 establishes location standards for Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDFs). Subsection 66264.18(a) prohibits the placement of TSDFs within 200 feet of a fault displaced during the Holocene epoch. Subsection 66264.18(b) requires that TSDFs located within a 100-year floodplain be capable of withstanding a 100-year flood. These standards are applicable to the construction of any new ground-water extraction and treatment facilities used as part of this remedial action.

### **11.2.2 Endangered Species Act**

The Endangered Species Act, 15 U.S.C. §§ 1531-1544, and implementing regulations, 40 C.F.R. § 6.302(h), 50 C.F.R. Parts 17, 222 and 402, are applicable to any remedial actions that impact a proposed or listed threatened or endangered species or destroy or adversely

modify the critical habitat of a listed species. The Preliminary Baseline Risk Assessment for the PVOU identified native plant communities, wildlife, special-status species, and sensitive habitat within the general area of the PVOU. No endangered species are known or suspected to occur in the locations where remedial action facilities might be constructed. If, however, it appears during the implementation of the remedial action that construction activities or the discharge of treated ground water might adversely affect a proposed or listed species, EPA will consult with the U.S. Fish and Wildlife Service (FWS) in accordance with 50 CFR Part 402 and ensure that regulatory requirements are followed so that adverse impacts are avoided or mitigated.

### **11.2.3 California Fish and Game Code**

California Fish and Game Code sections 2080, 5650(a), (b), and (f), 12015, and 12016 prohibit the discharge of harmful quantities of hazardous materials into places that may deleteriously affect fish, wildlife, or plant life. These provisions are applicable if the remedial action will result in the discharge of treated ground water to surface waters.

### **11.2.4 Archaeological and Historic Preservation Act**

This statute and implementing regulations, 16 U.S.C. § 469, 40 C.F.R. Part 6.301(c), establish requirements for the evaluation and preservation of historical and archaeological data that may be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program. The only known site of historical interest in the PVOU is the Workman and Temple Family Homestead Museum, located at 15415 Don Julian Road (a short distance north of cluster well MW6-6). These requirements are applicable if the remedial action will interfere with this facility.

### **11.2.5 Historic Sites, Buildings, and Antiquities Act**

The Historic Sites, Buildings, and Antiquities Act, 16 U.S.C. §§ 461-467, 40 C.F.R. Part 6.301(a), requires federal agencies to consider the existence and location of landmarks on the National Registry of Natural Landmarks to avoid undesirable impacts on such landmarks. The remedial action is not anticipated to affect any of the facilities regulated under the act. However, during preliminary design, a complete review will be made of impacted areas.

## **11.3 Action-specific ARARs**

### **11.3.1 Local Air Quality Management**

One VOC treatment technology that may be used is air stripping. Air emissions from air strippers are regulated by the California Air Resources Board, which implements the federal Clean Air Act (CAA), as well as the air pollution control requirements of the California H&SC, through local air quality management districts. Local districts may impose additional regulations to address local air emission concerns. The local air district for the PVOU is the South Coast Air Quality Management District (SCAQMD). The SCAQMD has adopted several rules that are ARARs for air stripper emissions and construction activities.

SCAQMD Regulation XIII, comprising Rules 1301 through 1313, establishes new source review requirements. Rule 1303 requires that all new sources of air pollution in the district use best available control technology (BACT) and meet appropriate offset requirements. Emissions offsets are required for all new sources that emit in excess of one pound per day.

SCAQMD Rule 1401 requires that best available control technology for toxics (T-BACT) be employed for new stationary operating equipment, so that the cumulative carcinogenic impact from air toxics does not exceed the maximum individual cancer risk limit of 10 in 1 million ( $1 \times 10^{-5}$ ). Many of the contaminants found in the PVOU ground water are air toxics subject to Rule 1401.

SCAQMD Rules 401 through 403 are also ARARs for construction and operation of remedial action facilities. SCAQMD Rule 401 limits visible emissions from a point source. Rule 402 prohibits discharge of material that is odorous or causes injury, nuisance, or annoyance to the public. Rule 403 limits downwind particulate concentrations.

### **11.3.2 Federal Clean Water Act and California Porter-Cologne Water Quality Act**

California's Porter-Cologne Water Quality Act incorporates the requirements of the federal Clean Water Act (CWA) and implements additional standards and requirements for surface and ground waters of the state.

#### **Water Quality Control Plan for the Los Angeles Region (Basin Plan)**

The RWQCB formulates and enforces water quality standards through a Basin Plan. The Basin Plan identifies the beneficial uses of surface and ground waters in the San Gabriel River watershed and establishes water quality objectives necessary to protect these beneficial uses. Water quality objectives impose limitations on receiving waters, rather than discharges, and are applicable to any water body that receives discharge from remedial activities in the PVOU.

The selected remedial action may result in the discharge of treated ground water to Puente Creek immediately upstream from San Jose Creek, which is tributary to the San Gabriel River. Table 2-1 of the Basin Plan identifies the following beneficial uses for San Jose Creek:

- Municipal and domestic supply (potential beneficial use)
- Ground-water recharge (intermittent beneficial use)
- Water contact recreation (potential beneficial use)
- Noncontact water recreation (intermittent beneficial use)
- Warm fresh water habitat (intermittent beneficial use)
- Wildlife habitat (existing beneficial use)

The Basin Plan identifies the same beneficial uses for the segment of the San Gabriel River below the confluence with San Jose Creek.

Since municipal and domestic water supply is a potential beneficial use of these surface waters, the MCLs listed in Table 1 are applicable as water quality objectives for San Jose

Creek. In addition, the following water quality objectives from Table 3-8 of the Basin Plan are ARARs for San Jose Creek and the relevant segment of the San Gabriel River:

- Total Dissolved Solids: 750 mg/L
- Sulfate: 300 mg/L
- Chloride: 150 mg/L
- Boron: 1.0 mg/L
- Nitrogen (NO<sub>3</sub>-N + NO<sub>2</sub>-N): 8 mg/L

The Basin Plan also establishes water quality objectives for ground water in the Puente and Main San Gabriel Basins (Table 3-10). These water quality objectives are applicable to any discharge that impacts ground water. However, if the selected remedy results in discharge to surface waters, it is expected to have a negligible effect on ground water (Camp, Dresser and McKee Inc., 1988).

#### **State Water Resources Control Board Resolution 68-16**

The Basin Plan also incorporates the State Water Resources Control Board (SWRCB) policy "Statement of Policy with Respect to Maintaining High Water Quality in California" (Resolution 68-16). Resolution 68-16 requires that existing water quality be maintained unless it is demonstrated that a change will benefit the people of California, will not unreasonably affect present or potential uses, and will not result in water quality less than prescribed by other state policies. Any activity that may increase the volume or concentration of a waste discharged to surface or ground water is required to use the "best practicable treatment or control."

Resolution 68-16 is applicable to discharges of treated ground water. The RWQCB requested that the PVSC evaluate the potential impact of nitrates and TDS contained in treated ground water on receiving waters and investigate alternative discharge options. The PVSC complied with this request and prepared a report, *Puente Valley Operable Unit Discharge Options Study Report* (Camp, Dresser & McKee Inc., 1998), which concluded that any discharges from the remedial action will not significantly impact receiving waters or their beneficial uses. The report also identified substantial costs associated with treatment of nitrates and TDS and failed to identify significant reliable alternative uses for nonpotable treated ground water. The RWQCB has determined that the selected remedy will comply with this ARAR as long as discharges to surface water are monitored and the estimated impacts on receiving waters are correct (*Consideration of Approval of a Resolution Supporting U. S. EPA's Proposed Plan for the Puente Valley Superfund Cleanup. Resolution 98-016, RWQCB, September 14, 1998*).

#### **State Water Resources Control Board Resolution 92-49**

Subsection III.G of the SWRCB's "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304" (Resolution 92-49) requires attainment of background water quality or, if background levels cannot be restored, the best quality of water that is reasonable. Resolution 92-49 is not an ARAR because this is an interim remedial action to contain the spread of contamination, rather than a final action to restore ground water in the PVOU.

### 11.3.3 Standards Applicable to CERCLA Section 104(b) Discharges to Surface Waters

Site investigation activities undertaken pursuant to CERCLA § 104(b) are considered to be removal actions. It is EPA policy that removal actions "comply with ARARs to the extent practicable, considering the exigencies of the circumstances." (55 Fed. Reg. 8756).

It is possible that certain site investigation activities will take place during remedial design, which will result in temporary high-flow, high-volume discharges of contaminated ground water (e.g., discharges from aquifer testing and spinner logging/depth-specific sampling of water supply wells). EPA has considered the best available technology economically achievable (BAT) for treatment and disposal of these discharges. The four disposal options that EPA considered are: (1) discharge to an existing drinking water distribution system, (2) onsite storage and disposal at a Resource Conservation and Recovery Act (RCRA)-approved hazardous waste facility, (3) discharge to a sanitary sewer for treatment at a wastewater treatment plant, and (4) onsite treatment and discharge to surface water channels. EPA has concluded that compliance with chemical-specific ARARs is not practicable, considering the exigencies of the circumstances, for many temporary high-flow, high-volume discharges.

EPA has determined that compliance with chemical-specific ARARs is practicable and necessary for CERCLA § 104(b) activities that do not result in temporary high-flow, high-volume discharges. EPA will determine the application of chemical-specific ARARs to CERCLA § 104(b) activities on a case-by-case basis. Where practicable, these discharges must comply with ARARs.

### 11.3.4 California Hazardous Waste Management Program

The federal RCRA establishes requirements for the management and disposal of hazardous wastes. In lieu of the federal RCRA program, the State of California is authorized to enforce its Hazardous Waste Control Act, and implement regulations (CCR Title 22, Division 4.5), subject to the authority retained by EPA in accordance with the Hazardous and Solid Waste Amendments of 1984 (HSWA). California is responsible for permitting treatment, storage, and disposal facilities within its borders and carrying out other aspects of the RCRA program. Some of the Title 22 regulations are applicable to the generation and disposal of hazardous wastes in the PVOU.

#### Hazardous Waste Generator Requirements

CCR Title 22 establishes requirements applicable to generators of hazardous waste. Implementation of the remedial action may generate hazardous waste as a result of ground-water monitoring and well installation (e.g., contaminated soil and ground water and used personal protective equipment). Hazardous waste may also be generated as a result of ground-water treatment to remove VOCs (e.g., spent carbon). These requirements are applicable to remedial actions in the PVOU.

The preamble to the NCP clarifies that when noncontiguous facilities are treated as one site, the movement of hazardous waste from one facility to another is subject to RCRA manifest requirements (55 Fed. Reg. 8691). Manifest requirements are ARARs in the event that the remedial action involve multiple water treatment units at different locations and require the movement of hazardous wastes (e.g., spent carbon) between these locations.

### **Land Disposal Restrictions**

CCR Title 22 defines hazardous wastes that cannot be disposed of to land without treatment. Land disposal requirements are applicable to the disposal of spent carbon generated during the treatment of ground water for removal of VOCs, if carbon adsorption is used, and the disposal of residuals associated with ground-water monitoring and well installation (e.g., contaminated soil and ground water, used personal protective equipment).

### **Hazardous Waste TSD Facility Requirements**

CCR Title 22, Division 4.5, Chapter 14, specifies Hazardous Waste TSDF requirements that regulate the design, construction, operation, and closure of RCRA-permitted TSDFs. Since the contaminated ground water is sufficiently similar to RCRA hazardous wastes, Title 22 TSDF requirements are relevant and appropriate for the design, construction, operation, and closure of any ground-water treatment systems. The Title 22 ARARs include the substantive requirements of the following provisions:

- Section 66264.14: Security Requirements
- Section 66264.25: Seismic and Precipitation Standards
- Section 66264.94: Ground Water Protection Standards
- Sections 66264.111-115: Closure of Treatment Units
- Sections 66264.170-178: Use and Management of Containers
- Sections 66264.600-603: Standards for Miscellaneous Treatment Units

## **11.4 ARARs Waivers**

This remedial action is an interim measure to contain contaminant migration. EPA, therefore, has not established chemical-specific ARARs for restoration of the contaminated portions of the PVOU. These ARARs will be addressed in the ROD for the PVOU.

## 12 Documentation of Significant Changes

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EPA presented the Proposed Plan for this interim action for public comment in January 1998. The Proposed Plan identified Alternative 3 as the preferred remedy and proposed that it be implemented through a performance-based approach. Alternative 3 includes ground-water extraction, containment, and treatment of contaminated ground water, and monitoring to ensure compliance with RAOs. EPA has reviewed all written and verbal comments submitted during the public comment period. Upon review of these comments, it was determined that no significant changes to the selected remedy, as presented in the Proposed Plan, were necessary.

## **13 Statutory Determinations**

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As required under Section 121 of CERCLA, EPA must select remedies that are protective of human health and the environment, comply with applicable or relevant and appropriate requirements (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employs treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes. The following sections discuss how the selected remedy meets these statutory requirements.

### **13.1 Protection of Human Health and the Environment**

The selected remedy will protect human health and the environment by limiting further downgradient and vertical migration of contaminated ground water and by removing significant contaminant mass from the aquifer. The remedy will reduce potential risks by decreasing the likelihood and magnitude of future exposure to contaminated ground water. Contaminant concentrations in the ground water in the areas to be addressed by the remedy are currently tens to thousands of times higher than acceptable levels. Available treatment technologies are technically feasible and proven effective in meeting ARARs for VOCs in the treated ground water and air. Implementation of the remedy will not pose unacceptable short-term risks. In addition, no adverse cross-media impacts are expected.

### **13.2 Compliance with ARARs**

The selected remedy shall comply with all ARARs, which are listed in Section 11 of this ROD. No ARARs waivers are expected to be needed. Because this is an interim action, EPA has not established chemical-specific ARARs for restoration of the ground water.

### **13.3 Cost-Effectiveness**

EPA believes the selected remedy is cost-effective and uses permanent solutions and treatment technologies to the maximum extent practicable. The selected remedy will reduce the mobility of the contaminants in the aquifer and will permanently reduce the volume of contamination by limiting the migration of contaminants and removing contaminant mass.

### **13.4 Community Acceptance**

Several commenters expressed support for EPA's proposed remedy. Some commenters did not believe that the remedy was necessary or supported by the information that has been collected to date. EPA has determined that the preferred alternative presented in the Proposed Plan represents the most appropriate remedy for the ROD site. None of the comments suggested a change to the overall remedy that EPA selected. The comments

received during the public comment period, along with EPA's responses, are presented in Part II of this ROD.

### **13.5 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent**

The selected remedy will include ground-water extraction and treatment for removal of VOCs to meet the performance criteria specified in this ROD. The selected remedy, therefore, is expected to use permanent solutions and alternative treatment technologies to the maximum extent practicable.

### **13.6 Preference for Treatment as a Principal Element**

The selected remedy will include ground-water treatment as a principal element of the remedy to meet the Performance Criteria.

### **13.7 Five-Year Reviews**

Because the remedy will result in hazardous substances remaining onsite above health-based levels, EPA shall conduct a review of the remedy, pursuant to CERCLA Section 121, 42 U.S.C. Section 9621, at least once every 5 years after commencement of remedial action. The review will assess whether the remedy continues to provide adequate protection of human health and the environment. If it is determined that the remedy is no longer protecting human health and the environment, then modifications to the remedy will be evaluated and implemented as necessary.

# 14 References

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## Tables

**Table 1**  
**ARARs for Chemicals of Potential Concern**

<b>Compound</b>	<b>ARAR (µg/L)</b>	<b>Source</b>
<b>1,1-Dichloroethane</b>	<b>5</b>	<b>California MCL</b>
<b>1,1-Dichloroethene</b>	<b>6</b>	<b>California MCL</b>
<b>1,1,1-Trichloroethane</b>	<b>200</b>	<b>Federal MCL</b>
1,1,2-Trichloro-1,2,2-trifluoroethane	1,200	California MCL
1,1,2-Trichloroethane	3	Federal MCLG
1,1,2,2-Tetrachloroethane	1	California MCL
1,2-Dichlorobenzene	600	Federal MCL
<b>1,2-Dichloroethane</b>	<b>0.5</b>	<b>California MCL</b>
<b>1,2-Dichloroethene (total)</b>	<b>6<sup>1</sup></b>	<b>California MCL</b>
1,2-Dichloropropane	5	Federal MCL
1,2,4-Trichlorobenzene	70	Federal MCL
1,2,4-Trimethylbenzene	-	-
1,3-Dichlorobenzene	600	Federal MCL
1,3 B Dichloropropene	0.5	California MCL
1,3,5-Trimethylbenzene	-	-
1,4-Dichlorobenzene	5	California MCL
2-Propanone	-	-
Benzene	1	California MCL
bis(2-Ethylhexyl)phthalate	4	California MCL
<b>Bromochloromethane</b>	<b>-</b>	<b>-</b>
Bromodichloromethane <sup>2</sup>	100	Federal MCL
Bromoform <sup>2</sup>	100	Federal MCL
Bromomethane	-	-
n-Butylbenzene	-	-
sec-Butylbenzene	-	-
tert-Butylbenzene	-	-
Carbon Disulfide	-	-
<b>Carbon Tetrachloride</b>	<b>0.5</b>	<b>California MCL</b>
Chlorobenzene	70	California MCL
Chloroethane	-	-
<b>Chloroform<sup>2</sup></b>	<b>100</b>	<b>Federal MCL</b>
cis-1,2-Dichloroethene	6	California MCL
cis-1,3-Dichloropropane	-	-
Dibromochloromethane <sup>2</sup>	100	Federal MCL
Dibromochloropropane	0.2	Federal MCL
Di-n-butylphthalate	-	-
Dichlorofluoromethane	C	C
Ethylbenzene	700	Federal MCL
Isopropyl alcohol	-	-
Isopropyl benzene	-	-
Methylene Chloride	5	Federal MCL
Naphthalene	-	-
Styrene	100	Federal MCL

**Table 1**  
**ARARs for Chemicals of Potential Concern**

Compound	ARAR (µg/L)	Source
<b><i>Tetrachloroethene</i></b>	<b><i>5</i></b>	<b><i>Federal MCL</i></b>
Total petroleum hydrocarbons	-	-
Total petroleum hydrocarbons-volatiles	-	-
trans-1,2-Dichloroethene	10	California MCL
trans-1,3-Dichloropropane	-	-
<b><i>Trichloroethylene</i></b>	<b><i>5</i></b>	<b><i>Federal MCL</i></b>
<b><i>Trichlorofluoromethane</i></b>	<b><i>150</i></b>	<b><i>California MCL</i></b>
<b><i>Toluene</i></b>	<b><i>150</i></b>	<b><i>California MCL</i></b>
Vinyl Chloride	0.5	California MCL
m,p-Xylene <sup>3</sup>	-	-
o-Xylene <sup>3</sup>	-	-
<b><i>Xylenes, total</i></b>	<b><i>1,750</i></b>	<b><i>California MCL</i></b>
<sup>1</sup> Value for the cis-isomer; value for trans-isomer is 10 µg/L. <sup>2</sup> These chemicals are trihalomethanes (THMs); the MCL listed is for all four THMs: chloroform, bromodichloromethane, dibromochloromethane, and bromoform. <sup>3</sup> Value for total xylenes is 10,000 µg/L; no values are provided for individual isomers.  Notes: - indicates "no MCL has been established or proposed." Bold/Italicized text indicates compounds detected in groundwater during RI (PVSC monitoring wells or Suburban Water Systems wells).		

**Table 2**  
**Estimated Total Noncancer Hazard Index from Domestic Use of Groundwater**  
**Puente Valley Operable Unit**

Wells	Average Exposure		Reasonable Maximum Exposure		Major Chemical Contributors
	Ingestion	Inhalation	Ingestion	Inhalation	
Production Well 08000077	0.03	0.03	0.03	0.03	1,1-Dichloroethene, Trichloroethene
Production Well 98000068	0.07	0.07	0.09	0.09	Tetrachloroethene, Trichloroethene
Production Well 98000108	0.2	0.2	0.2	0.2	1,1-Dichloroethene, Trichloroethene
Well Group 1	0.6	0.6	0.6	0.6	1,1-Dichloroethene, Trichloroethene
Well Group 2	1	1	2	2	1,1-Dichloroethene, 2-Propanone
Well Group 3	40	30	60	60	1,1-Dichloroethene, Trichloroethene
Well Group 4	2	2	2	2	Tetrachloroethene, Trichloroethene
Well Group 5	20	20	40	40	Methylene Chloride, 2-Propanone, Trichloroethene
Well Group 6	0.9	0.9	1	1	Tetrachloroethene, Trichloroethene
Well Group 7	1	1	2	2	Tetrachloroethene, Trichloroethene
Well Group 8	0.4	0.4	0.5	0.5	1,1-Dichloroethene, Trichloroethene

**Table 3**  
**Estimated Total Excess Lifetime Cancer Risk from Domestic Use of Groundwater**  
**Puente Valley Operable Unit**

Wells	Average Exposure		Reasonable Maximum Exposure		Major Chemical Contributors
	Ingestion	Inhalation	Ingestion	Inhalation	
Production Well 08000077	$5 \times 10^{-7}$	$7 \times 10^{-8}$	$2 \times 10^{-6}$	$3 \times 10^{-7}$	Tetrachloroethene
Production Well 98000068	$3 \times 10^{-6}$	$2 \times 10^{-7}$	$1 \times 10^{-5}$	$7 \times 10^{-7}$	Tetrachloroethene, Trichloroethene
Production Well 98000108	$4 \times 10^{-6}$	$5 \times 10^{-7}$	$2 \times 10^{-5}$	$2 \times 10^{-6}$	Tetrachloroethene, Trichloroethene
Well Group 1	$4 \times 10^{-6}$	$7 \times 10^{-7}$	$1 \times 10^{-5}$	$2 \times 10^{-6}$	Tetrachloroethene, Trichloroethene
Well Group 2	$4 \times 10^{-5}$	$8 \times 10^{-6}$	$1 \times 10^{-4}$	$3 \times 10^{-5}$	1,4-Dichlorobenzene, Tetrachloroethene, Vinyl Chloride
Well Group 3	$2 \times 10^{-4}$	$1 \times 10^{-4}$	$1 \times 10^{-3}$	$7 \times 10^{-4}$	1,2-Dichloroethane, Tetrachloroethene, Trichloroethene
Well Group 4	$1 \times 10^{-4}$	$6 \times 10^{-6}$	$4 \times 10^{-4}$	$3 \times 10^{-5}$	Tetrachloroethene, Vinyl Chloride
Well Group 5	$4 \times 10^{-4}$	$2 \times 10^{-4}$	$3 \times 10^{-3}$	$2 \times 10^{-3}$	1,2-Dichloroethane, Methylene Chloride, Trichloroethene
Well Group 6	$4 \times 10^{-5}$	$4 \times 10^{-6}$	$2 \times 10^{-4}$	$2 \times 10^{-5}$	Tetrachloroethene, Trichloroethene
Well Group 7	$6 \times 10^{-5}$	$2 \times 10^{-6}$	$4 \times 10^{-4}$	$2 \times 10^{-5}$	Tetrachloroethene
Well Group 8	$4 \times 10^{-6}$	$2 \times 10^{-6}$	$2 \times 10^{-5}$	$8 \times 10^{-6}$	Tetrachloroethene, Trichloroethene

**Table 4**  
**Cost Comparison of Alternatives<sup>1</sup>**  
**(\$1,000s)**

<b>Alternative</b>	<b>Capital Costs</b>	<b>Annual O&amp;M Costs</b>	<b>Net Present Worth (30-years @ 5%)</b>
<b>2</b>	<b>\$2,344</b>	<b>\$360</b>	<b>\$7,878</b>
<b>3</b>	<b>\$8,276</b>	<b>\$1,270</b>	<b>\$27,798</b>
<b>4</b>	<b>\$11,751</b>	<b>\$1,634</b>	<b>\$36,869</b>

<sup>1</sup> Net Present Worth is based on discharge to San Jose Creek with treatment for VOCs only.

**Table 5**  
**B7 Production Wells**  
**Puente Valley Operable Unit**

Well Identification	Station Identification
152W1	01900337
147W1	01901596
105W1	01901608
134W1	01901623
150W1	01902519
147W3	08000077
B7E	08000122
B9	91901437
B11A	91901439
B7B	91901440
B7C	98000068
B7D	98000094
B9B	98000099
B11B	98000108

## Figures

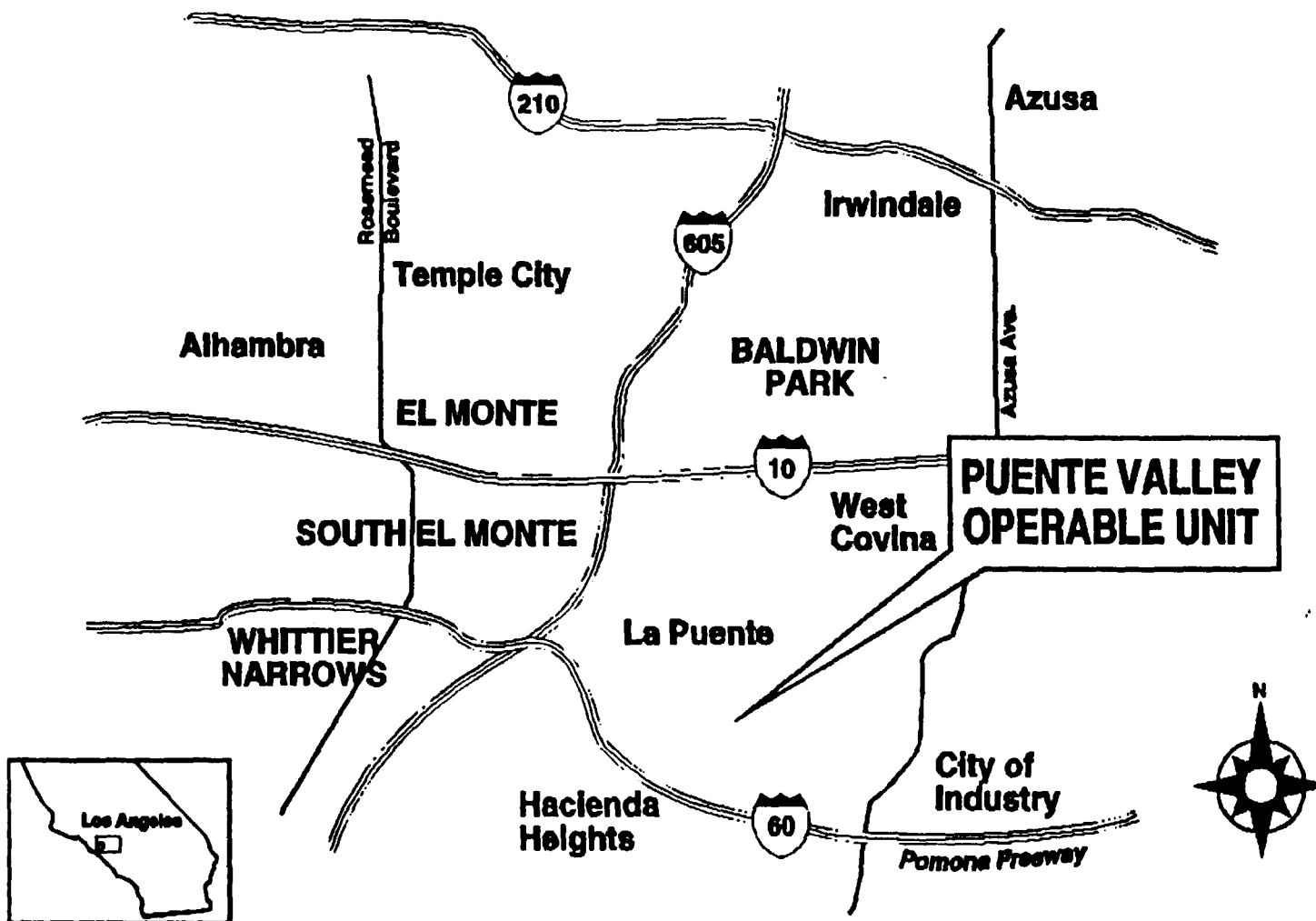
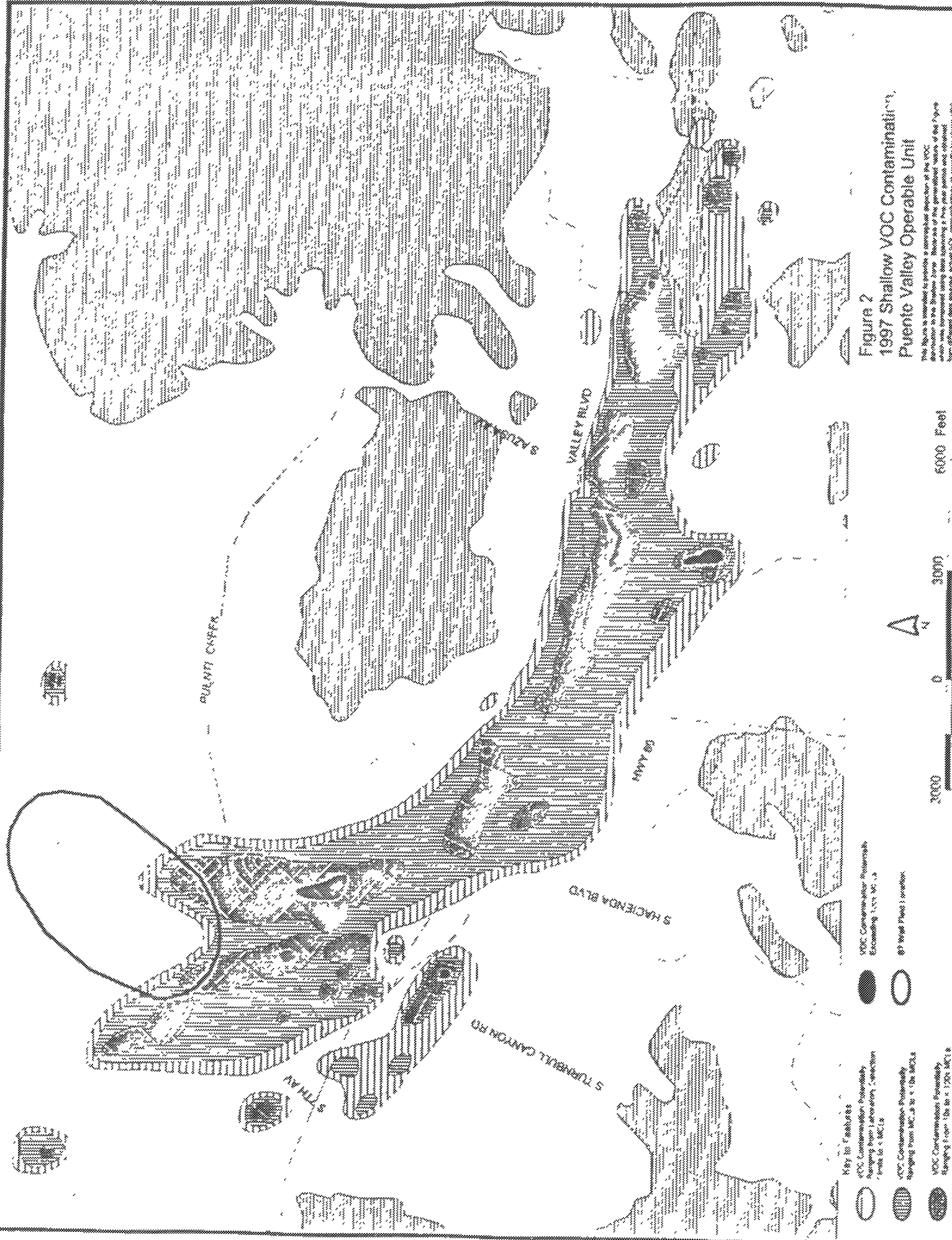


Figure 1  
Vicinity Map  
Puente Valley Operable Unit

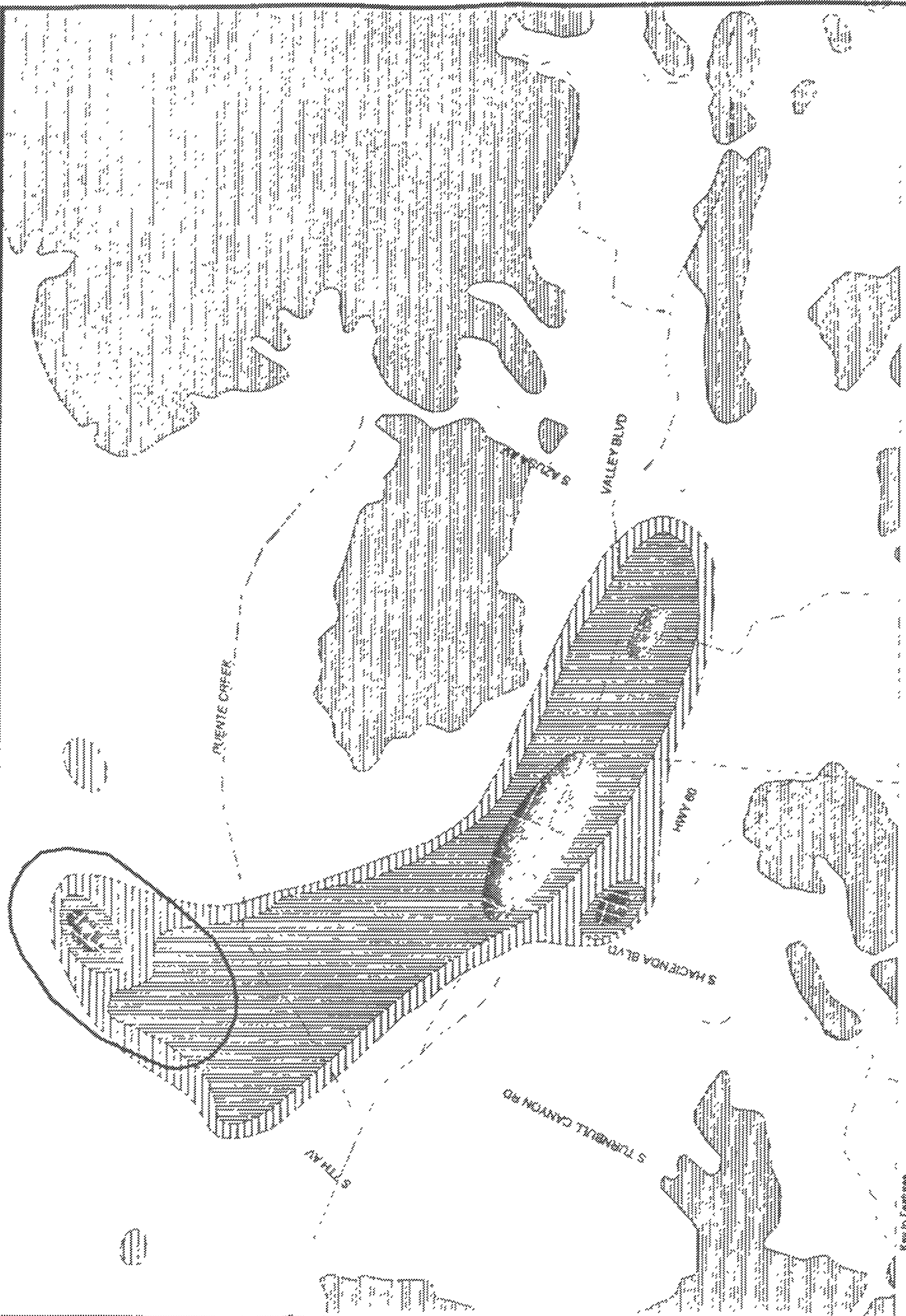


**Figure 2**  
**1997 Shallow VOC Contamination,**  
**Puente Valley Operable Unit**

This figure is intended to provide a general depiction of the VOC contamination in the Puente Valley Operable Unit. It is not intended to provide a detailed depiction of the VOC contamination. The figure is based on data from the 1997 monitoring program. The figure is not intended to provide a detailed depiction of the VOC contamination. The figure is based on data from the 1997 monitoring program. The figure is not intended to provide a detailed depiction of the VOC contamination. The figure is based on data from the 1997 monitoring program.

- Key to Symbols**
- VOC Contamination Potentiality  
Ranging from Laboratory Detection  
Levels to < MCLs
  - VOC Contamination Potentiality  
Ranging from MCLs to < 10x MCLs
  - VOC Contamination Potentiality  
Ranging from 10x to > 100x MCLs
  - VOC Contamination Potentiality  
Exceeding 1,000 MCLs
  - 87 West Field Location



































**Figure 3**  
**1997 Intermediate VOC Contamination,**  
**Puente Valley Operable Unit**

The figure is intended to provide a conceptual depiction of the VOC distribution in the Puente Valley. The level of the plume is not depicted as a continuous plume, but as a series of plumes originating from different sources. The plume is shown as a series of plumes originating from different sources. The plume is shown as a series of plumes originating from different sources.

- Key to Features**
- VOC Contamination Plume  
Ranging from 1 to 1000 MCLs
  - VOC Contamination Plume  
Ranging from 1000 to 10000 MCLs
  - VOC Contamination Plume  
Ranging from 10000 to 100000 MCLs
  - BT well head location

ALTERNATIVE	Overall Protection of Human Health and Environment	Compliance with ARARS	Long-term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume	Short-term Effectiveness	Implementability	Cost (\$1,000s)	State Acceptance	Community Acceptance
1 (No Action)					N/A	N/A	N/A		
2 (Groundwater Monitoring)							C-\$2,244 NPW-\$7,778		
3 (Mouth Extraction)							C-\$8,276 NPW-\$27,798		
4 (Mouth and Mid-Valley Extraction)							C-\$11,751 NPW-\$36,869		

N/A - Not Applicable; no actions implemented



Low



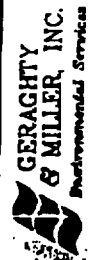
Medium



High

NPW - Net Present Worth, 5%; 30 yrs

**Figure 4**  
Qualitative Criteria  
Evaluation Matrix  
Puente Valley Operable Unit



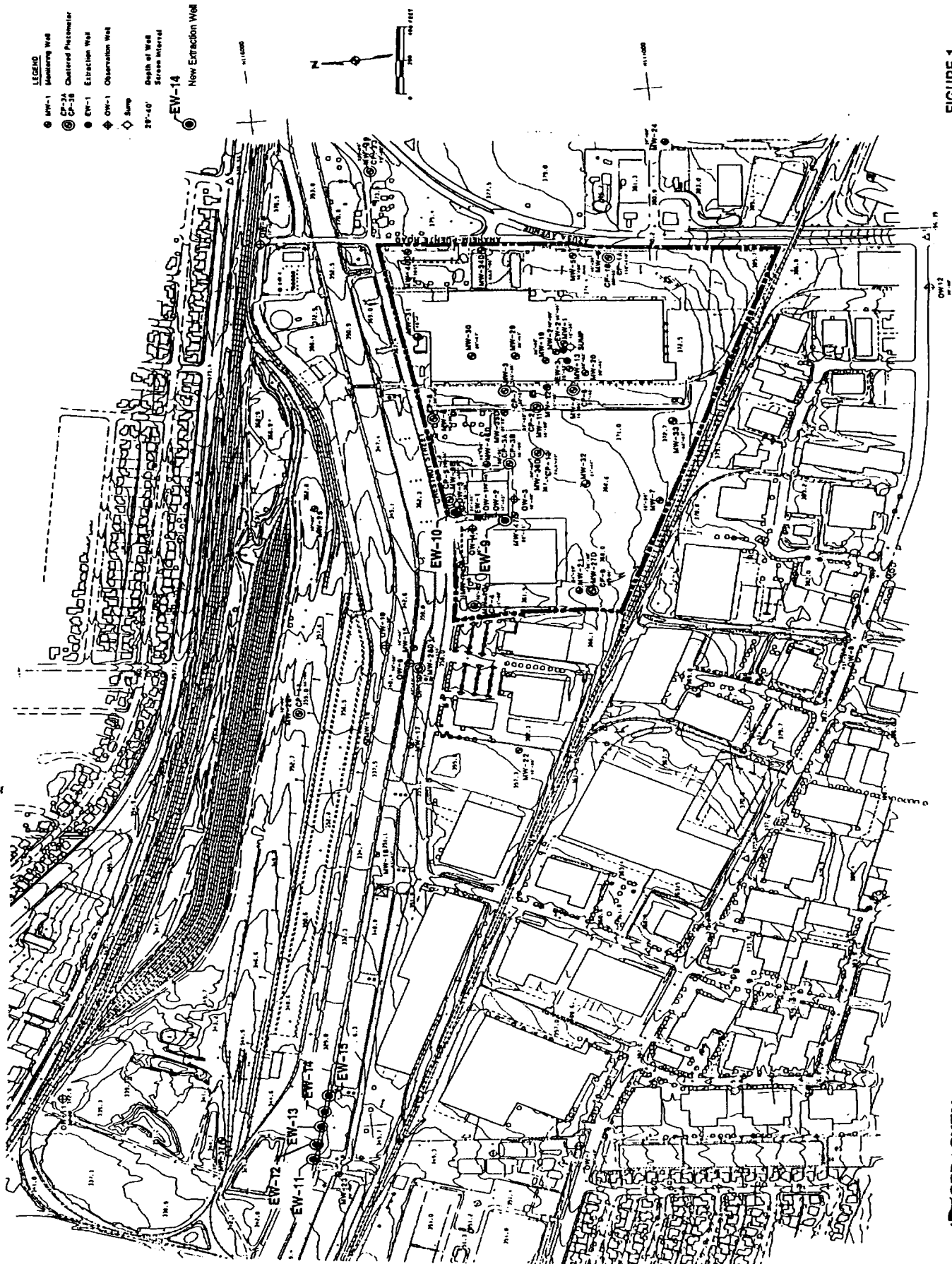


FIGURE 1

APPROXIMATE LOCATIONS OF  
NEW EXTRACTION WELLS  
JANUARY 1988

**Attachment 3 to Administrative Order 2001-20**

**RD/RA STATEMENT OF WORK**

**Puente Valley Operable Unit**

**SAN GABRIEL VALLEY SUPERFUND SITES**

**LOS ANGELES COUNTY, CALIFORNIA**

September 2001

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**STATEMENT OF WORK FOR  
REMEDIAL DESIGN AND REMEDIAL ACTION  
ATTACHMENT 3 TO ADMINISTRATIVE ORDER 2001-20**

Puente Valley Operable Unit  
San Gabriel Valley Superfund Site Area 4

**I Introduction**

This Statement of Work (SOW) describes the activities the Respondent must perform in order to design, construct, operate, maintain, monitor, and evaluate the interim shallow zone remedial action described in the Puente Valley Operable Unit (PVOU) Record of Decision (ROD), dated September 30, 1998 and this SOW. This SOW is Attachment 3 to the Puente Valley Operable Unit Unilateral Administrative Order ("Order") 2001-20.

The Puente Valley Operable Unit addresses a several-mile-long area of groundwater contamination extending beneath portions of the City of Industry and La Puente in Los Angeles County, California. Chemicals of potential concern in the groundwater include volatile organic compounds (VOCs) listed in Table 1 of the ROD.

EPA intends to review deliverables to assess whether or not the interim remedial action will achieve the remedial objectives, and Performance Criteria set forth in the ROD and the SOW. EPA review or approval of a task or deliverable shall not, however, be construed as a guarantee of the adequacy of such task or deliverable.

The definitions set forth in Section VI of the Order shall apply to this SOW unless expressly provided otherwise herein.

**II Summary of the Puente Valley OU Shallow Zone Remedial Action**

The ROD requires the remedial action to prevent shallow zone groundwater contamination which exceeds 10 times the ARARs listed in Table 1 of the ROD from migrating beyond its current lateral and vertical extent. Shallow zone contamination is largely concentrated in three areas across the mouth of Puente Valley (see Figure 2 in the ROD). Groundwater must be monitored for compliance in each of three plume areas to verify that Performance Criteria are not exceeded. EPA shall approve the locations and specifications of the shallow zone compliance wells.

Sentinel monitoring wells should be located upgradient from compliance wells, such that if ARARs are exceeded or are expected to be exceeded in monitoring wells, adequate time is available to take action to maintain concentrations below ARARs at the compliance wells.

Initial remedial design work shall focus on the installation of compliance and sentinel wells in the shallow zone at the mouth of the Puente Valley.

### III Performance Criteria

As specified in the Order, the Respondent shall meet all Performance Criteria, Remedial Action Objectives (RAOs) and Applicable or Relevant and Appropriate Requirements (ARARs) set forth in the ROD and this SOW. The ROD states that the RAOs for the PVOU are to prevent exposure of the public to contaminated groundwater; inhibit vertical and horizontal contaminant migration from the more highly contaminated portions of the aquifer to the less contaminated areas; reduce the impact of continued contaminant migration on downgradient water supply; and protect future uses of less contaminated and uncontaminated areas. All compliance monitoring data shall be reported in the Quarterly Compliance Monitoring Reports. The ROD requires that the remedial action provide sufficient hydraulic control of contaminated groundwater in the shallow zone to meet the Performance Criteria.

The Performance Criteria include the treatment standards, standards of control, quality criteria, and other substantive requirements, criteria or limitations included in the ROD.

#### A. Shallow Zone Compliance with Performance Criteria

The remedial action shall prevent groundwater in the shallow zone with VOC contamination from exceeding 10 times the ARARs listed in Table 1 of the ROD from migrating beyond its current lateral and vertical extent as described in the RI/FS for the PVOU. Shallow zone contamination is largely distributed across the mouth of Puente Valley (Figure 2 of the ROD). Groundwater must be monitored for compliance across the mouth of Puente Valley to verify that Performance Criteria are not exceeded.

The Respondent shall monitor compliance with this criterion at a minimum of eight (8) wells that meet the following requirements and have been approved by EPA:

- (1) Wells located laterally and vertically downgradient of groundwater contamination exceeding 10 times the ARARs, but within areas with detectable VOC contamination in the shallow zone;
- (2) Wells completed with screen lengths of 20 feet or less located between the water table and 150 feet bgs. Longer screened intervals may be appropriate in limited situations, subject to EPA evaluation and approval on a case-by-case basis.

To avoid exceedances of the shallow zone performance criterion, the Respondent shall install additional sentinel wells and use existing wells, where appropriate, as an early warning system to provide the Respondent sufficient time to address and prevent noncompliance. If actual or potential noncompliance is imminent, the Respondent shall notify the EPA of the nature of the noncompliance five (5) days after the Respondent receives information indicating noncompliance, as outlined in the schedule.

The Respondent shall initially conduct quarterly sampling, and the results shall be reported in the Quarterly Compliance Monitoring Reports. The frequency of sampling

may be decreased if the monitoring data supports such a decrease, and the Respondent obtains EPA approval. Contaminant concentrations at the compliance wells will be the primary criterion for evaluating compliance. EPA expects that groundwater containment actions will be implemented sufficiently upgradient of the compliance wells to provide enough of a buffer zone to allow additional actions to be taken, if necessary, to ensure compliance.

#### D. Additional Requirements

Implementation of the remedial action shall not adversely affect production wells that are not part of the remedial action (i.e., shall not increase the migration of contamination into the wells). In addition, the remedial action must provide capture of groundwater contamination exceeding ARARs without relying on the effects of wells that are not part of the remedial action.

Indications of an imminent exceedance of the Performance Criteria at a compliance well will be considered as evidence that groundwater contamination is migrating and that additional hydraulic containment is required. In the event of an actual or imminent exceedance of the Performance Criteria at the compliance wells, the Respondent shall implement additional groundwater extraction and treatment to achieve sufficient hydraulic control. Actual exceedance of the Performance Criteria at a compliance well is a violation of the Order.

#### E. Groundwater Treatment and Disposal

The Respondent shall treat all groundwater that is extracted in accordance with this SOW. The Respondent shall install and operate the treatment system that is designed to reduce the concentrations of the contaminants listed in Table 1 of the ROD to below ARARs.

All extracted groundwater must be treated with air stripping (with off-gas controls) or liquid-phase carbon adsorption to remove the contaminants listed in Table 1 of the ROD. If alternative treatment technologies are proposed, EPA will evaluate the alternative technologies in accordance with the criteria specified in 40 CFR Section 300.430 during remedial design.

Following treatment, extracted groundwater can either be provided to local water agencies, users, or purveyors for use in the San Gabriel Basin ("the Basin") as reclaimed water, or discharged to the San Jose Creek. Disposal of the treated groundwater must comply with the ARARs identified in the ROD. In addition, introduction of treated groundwater into a public water supply is an offsite activity that must comply with all other state and federal requirements in effect at the time of the activity.

The extraction and treatment of groundwater shall comply with the following requirements:

1. Treatment systems shall be designed and operated to reduce the concentrations of contaminants to below the ARARs listed in Table 1 of the ROD under all anticipated operating conditions;
2. Best available control technology for toxics (T-BACT) shall be used on new stationary operating equipment, so the cumulative carcinogenic impact from air toxics does not exceed the maximum individual cancer risk limit of ten in one million ( $1 \times 10^{-5}$ ), as required by South Coast Air Quality Management District (SCAQMD) Rule 1401;
3. Extraction and treatment systems shall comply with the substantive portions of SCAQMD Regulation XIII, comprising Rules 1301 through 1313, pertaining to new source review;
4. Extraction and treatment systems shall comply with the water quality objectives for discharge of treated water from the Regional Water Quality Control Board (RWQCB) Los Angeles Basin Plan and State Water Resources Control Board (SWRCB) Resolution 68-16, as outlined in the ROD;
5. Extraction and treatment systems shall comply with limits in visible emissions (SCAQMD Rule 401) and particulate concentrations (SCAQMD Rule 403);
6. Extraction and treatment systems shall not cause the discharge of material that is odorous or causes injury, nuisance or annoyance to the public (SCAQMD Rule 402);
7. Extraction and treatment systems shall comply with the substantive requirements in Title 22, California Code of Regulations (CCR), Sections 66264.601 -.603 for *miscellaneous units*, and related substantive closure requirements in Sections 66264.111-.115 for air strippers or granular activated carbon (GAC) contractors;
8. Extraction and treatment systems shall comply with container and storage requirements in Title 22, CCR, Sections 66264.170 -.178 for the storage of contaminated groundwater over 90 days;
9. Extraction and treatment systems shall comply with Title 22, CCR, Sections 66262 and 66268 and other State Hazardous Waste Control Act (HWCA) requirements for storage and disposal if the spent carbon is classified as a hazardous waste; and
10. Extraction and treatment systems shall comply with the substantive portions of the State Water Well Standards for construction of water supply wells.

#### IV List of Deliverables and Other Tasks

The Respondent shall submit plans, specifications, and other deliverables for EPA review and approval, as specified below. One copy of each final written deliverable shall be provided in an unbound format suitable for reproduction; additional copies shall be provided as stated in

the Order. Information presented in color must be legible and interpretable when reproduced in non-color. If EPA requests, final written deliverables shall also be provided in electronic format.

The Respondent shall implement quality control procedures to ensure the quality of all reports and submittals to EPA. These procedures shall include but are not limited to: internal technical and editorial review; independent verification of calculations; and documentation of all reviews, problems identified, and corrective actions taken.

As described in Section XIV of the Order, EPA may approve, disapprove, or modify each deliverable. Major deliverables are described below shall be submitted according to the schedule in Section V of this SOW.

#### A. Compliance and Sentinel Well Network Plan

The Respondent shall demonstrate to EPA's satisfaction that each proposed well is appropriate for measuring compliance, as described in Section III (Performance Criteria) of this SOW. The Respondent must demonstrate that each proposed sentinel well is appropriate for detecting the migration of shallow zone contamination exceeding 10 times ARARs, as described in Section III of this SOW. Prior to installation of compliance and sentinel wells, the Respondent shall submit to EPA a Compliance and Sentinel Well Network Plan, describing the proposed locations and specifications of the compliance wells. All existing wells that may be used for compliance or sentinel purposes must be described in this plan. Additionally, all proposed new compliance and sentinel wells must be described.

This plan shall include sampling procedures for confirming the adequacy of all proposed compliance and sentinel wells. The Respondent must sample each proposed compliance and sentinel well at least two times to demonstrate that each well is suitable for its intended purpose. Additional confirmation sampling may be required for proposed compliance wells with initial indeterminate sampling results. After installation and sufficient sampling of each proposed compliance and sentinel well, EPA shall determine whether each well is acceptable for its proposed use.

After EPA approval of the Compliance and Sentinel Well Network Plan, the Respondent shall submit to EPA monthly well installation progress reports.

#### B. Additional Wells

In addition to the installation of compliance and sentinel monitoring wells, the Respondent will also install additional wells as needed, to:

1. adequately define the hydrostratigraphy, hydraulic conductivities, and piezometric conditions in the shallow zone in the mouth of the valley area, in the vicinity of where active extraction is expected to occur;

2. adequately define the degree of hydraulic connection between the shallow and intermediate zones at the mouth of the valley area;
3. adequately define the extent of groundwater contamination in the shallow zone to determine areas that may require hydraulic control or capture to meet the Performance Criteria.

These wells may serve as compliance, sentinel, or data collection wells. The scope of the necessary design-level investigations, including further details regarding data collection objectives and the appropriate iterative nature of data collection, will be specified in the Compliance Monitoring Well Network Plan.

#### C. Compliance and Sentinel Well Installation Complete Report

After EPA approval of the Compliance and Sentinel Well Network Plan, the Respondent shall submit a Compliance and Sentinel Well Installation Complete Report, signifying the time at which compliance monitoring will begin. This report will include all sampling results for all proposed compliance and sentinel wells, and the data must show concentration trends that adhere to the requirements for all compliance and sentinel wells as outlined in the ROD and this SOW. After EPA approval of the Compliance and Sentinel Well Installation Complete Report, the Respondent shall assume quarterly sampling of each well to ensure that the Performance Criteria are met in the shallow zone, and submit quarterly compliance monitoring reports, as required by the Compliance Monitoring Plan, described in Section IV.D of this SOW.

#### D. Compliance Monitoring Plan

Compliance monitoring activities shall be performed in accordance with the approved Compliance Monitoring Plan, to evaluate whether the Performance Criteria, as described in Section III of this SOW and in the ROD, are met. Compliance with Performance Criteria will be measured primarily by the sampling results of the compliance monitoring wells. The Compliance Monitoring Plan shall specify the locations of compliance wells and any sentinel wells; sampling methods; and, at a minimum, a quarterly sampling frequency. The Respondent shall submit the Compliance Monitoring Plan no later than the specified date in the approved schedule. Compliance with the Performance Criteria will be confirmed by results from sampling at EPA-approved compliance wells on a quarterly basis, and shall be documented in Quarterly Compliance Monitoring Reports. Within 5 days of receipt of information indicating noncompliance or the likelihood of noncompliance, EPA shall be notified and confirmation samples must be taken. The Compliance Monitoring Plan shall address the following requirements:

### 1. Data Collection Parameters

The Respondent shall specify the locations of compliance and sentinel wells in the shallow zone. Such wells shall comply with and be adequate to meet the Performance Criteria. The Compliance Monitoring Plan shall contain sufficient information for EPA to assess whether the compliance and sentinel wells meet Performance Criteria. The Respondent shall specify sampling methods, and, at a minimum, a quarterly sampling frequency.

### 3. Computer Modeling

The Respondent shall perform computer model simulations of groundwater flow and contaminant migration to help determine whether the remedial action will sufficiently contain the groundwater contamination during all anticipated recharge conditions (i.e., demonstrating that simulated particles originating in contaminated areas converge into the extraction wells); and propose and evaluate modifications to the extraction plan, if needed, using an appropriate 3-dimensional, time-varying model of groundwater flow. All appropriate modeling improvements shall be made in accordance with EPA recommendations in the Technical Memorandum, *“Technical Review: Puente Valley Operable Unit, Wells B7C and B11B Investigation Report of Findings, Prepared by the Puente Valley Steering Committee,”* and any new transmissivity measurements, and other relevant information. The Respondent shall submit to EPA any changes in critical modeling assumptions, and discuss their affect on recommended extraction rates and well locations. The Compliance Monitoring Plan shall describe proposed changes to the calibration of an existing model or plans to calibrate a new model, or propose a schedule for providing such information. All models must be calibrated by the Respondent and approved by EPA prior to use.

### 4. Split Sampling

The Compliance Monitoring Plan shall specify procedures for coordination of EPA or State collection of split or replicate samples.

### 5. Contingency Action

The Compliance Monitoring Plan shall propose contingency plans to be used in the event that additional compliance monitoring activities are required to evaluate compliance with Performance Criteria. Contingency actions could include increases in monitoring frequency, and installation of additional groundwater monitoring wells. If compliance monitoring data indicate non-compliance, the Respondent shall submit a Compliance Action Plan to EPA within 14 days of receipt of information indicating noncompliance or the likelihood of noncompliance. Actions may include, but not necessarily be limited to, additional compliance monitoring to confirm the finding, operational

modifications followed by additional compliance monitoring, or design and construction efforts for additional extraction activities. After the Compliance Action Plan is approved by EPA, the Respondent shall perform the corrective action(s) and document such action(s) in the Compliance Correction Report.

#### E. Remedial Design / Remedial Action Work Plan

The Respondent shall submit a Work Plan which describes the management strategy for design and construction of the remedial action ("RD/RA Work Plan"). The RD/RA Work Plan must be reviewed and approved by EPA in accordance with Section IX of the Order. The Work Plan shall include:

##### 1. Updated Project Description

The RD/RA Work Plan shall include a description of the work to be implemented by the Respondent. The work should first and foremost focus on the location, installation and monitoring of compliance and sentinel wells in the shallow zone at the mouth of Puente Valley, and should be described in the Compliance and Sentinel Well Network Plan and the Compliance and Sentinel Well Completion Report, as required in Section IV of this SOW. The Work Plan shall also include, where applicable, extraction locations; treatment technologies; discharge of the treated water (i.e., recipients, delivery locations, delivery pressures, and delivery rates); locations of major project components; existing equipment and facilities to be used as part of the remedial action; and other key aspects of the project. The Work Plan shall briefly discuss the condition, anticipated longevity, and any limitations in the use of each existing facility.

##### 2. Description of the Responsibility and Authority of All Organizations and Key Personnel Involved With the Remedial Action.

The RD/RA Work Plan shall include a description of the responsibilities and qualifications of key personnel expected to direct or play a significant role in the Remedial Design, Remedial Action, or Operation and Maintenance, including the Respondent's Project Coordinator, Designer, Construction Contractor, Construction Quality Assurance personnel, and Resident Engineer. The Work Plan shall define lines of authority and provide brief descriptions of duties.

##### 3. Updated Schedule

The RD/RA Work Plan shall identify the initiation and completion dates for each required design activity, construction activity, inspection, and deliverable required by the Order and this SOW, consistent with the schedule included as Section V of this SOW. The Work Plan shall also identify the approximate

timing of meetings and other activities which may require EPA participation, but are not identified in Section V of this SOW.

The schedule shall indicate that coordination meetings will initially occur on a monthly basis and may be decreased in frequency as deemed appropriate by EPA. The coordination meetings shall address project status, problems, solutions, and schedule. A representative of the Respondent shall prepare a meeting summary to document all decisions made, issues outstanding, schedule changes, planned follow up, and assignments.

#### 4. Contracting Strategy

The RD/RA Work Plan shall briefly describe the planned contracting strategy, including a brief description of the process for evaluation and approval of construction changes and EPA review and approval of significant changes.

#### 5. Plans for Satisfying All Permitting Requirements and Acquiring Property, Leases, Easements, or Other Access.

The RD/RA Work Plan shall list all permits, property, leases, and easements required for implementation of the remedial action; permits, property, leases, and easements acquired to date; and a schedule for submittal of permit applications and acquisition of property, leases, or easements not yet obtained.

Where normally required, permits must be obtained for all off-site activities, such as from the California Department of Health Services for domestic use of treated water. The Respondent is not required to obtain permits for on-site remedial activities, but must comply with all substantive requirements, including local building codes. If permits will not be obtained for an onsite activity where a permit is normally required, the Respondent shall describe all consultative or coordination activities planned to identify and satisfy the substantive requirements.

#### 6. Third Parties Necessary for Design, Construction, or Operation of the Remedial Action.

The RD/RA Work Plan shall describe the roles and responsibilities of the Respondent, participating water producers and water agencies, if applicable, and other parties expected to play a significant role in the design, construction, or operation of the remedial action. The Work Plan shall summarize and provide copies of Memorandums of Understanding (MOUs) and draft or final agreements with water producers and other third parties expected to participate in implementation of the remedial action.

If legally-binding agreements are not in place, the Work Plan shall describe commitments made to date and planned efforts to secure necessary commitments including a schedule. If the participation of a third party is uncertain, the Work Plan shall describe alternatives to be implemented in the event that the party does not fulfill its planned role. Possible third party roles include agreeing to the use of existing equipment (e.g., groundwater extraction wells, water treatment facilities, pipelines, groundwater recharge facilities), treatment plant operation, and acceptance of treated groundwater.

**7. Identification of Any Concerns about the Quantity, Quality, Completeness, or Usability of Water Quality or Other Data Upon Which the Design Will Be Based**

The Respondent shall provide a description of additional data collection efforts, if any, required for completion of the Remedial Design. The Respondent shall consider whether any data are needed to verify that critical design assumptions remain valid (e.g., the areas of groundwater contamination requiring hydraulic containment). If additional data are required, the Respondent shall propose a schedule for preparation of a Sampling and Analysis Plan (or Addendum) and implementation of the Plan.

**8. A Description of Planned Community Relations Activities to Be Conducted During Remedial Design or Remedial Action.**

In accordance with Section IX of the Order, the Respondent shall cooperate with EPA and the State in providing information regarding the Work to the public. As requested by EPA or the State, the Respondent shall participate in the preparation of such information for dissemination to the public and in public meetings which may be held or sponsored by EPA or the State to explain activities at or relating to the Site.

**9. Updates to the RD/RA Work Plan and Periodic Reporting to EPA**

The RD/RA Work Plan shall describe provisions for reporting progress to EPA (consistent with the schedule included in Section V of this SOW and the Compliance Monitoring Plan to be prepared in accordance with Section IV.D of this SOW). The RD/RA Work Plan shall also describe how the Work Plan will be updated as needed to document changes or provide information not available at the time the Work Plan is submitted.

If any of the information requested is not known at the time the RD/RA work plan must be submitted, and omitting the information from the work plan will not prevent compliance with any other requirements of this SOW, the Respondent may submit the information at a later date. If any information is omitted, the Respondent shall note in the work plan that the missing information was not available and specify when it will be submitted.

## F. Remedial Design

Remedial Design activities shall include the preparation of clear and comprehensive design documents, construction plans and specifications, and other design activities needed to implement the work and satisfy Performance Criteria set forth in the ROD and this SOW. All plans and specifications shall be developed in accordance with relevant portions of the U.S. EPA's Superfund Remedial Design/Remedial Action Handbook (EPA 540/R-95/059), and in accordance with the schedule set forth in Section V of this SOW.

### 1. Conceptual/Preliminary Design

The Respondent shall submit a Conceptual/Preliminary Design in accordance with the approved schedule. EPA approval is required before proceeding with further design work, unless EPA agrees otherwise. It is assumed that the design-build contractor will prepare the Conceptual/Preliminary Design and subsequent design submittals. Unless modified by EPA, the Conceptual/Preliminary Design submittal shall include or address, at a minimum, the following:

a. A detailed Design Basis Report that presents and justifies the concepts, assumptions, standards, and preliminary interpretations and calculations used in the design. The Design Basis Report shall include:

- (1) Volume or flow rate of water, brine, air, sludge, and other media requiring treatment or disposal;
- (2) A summary of water quality or other data to be used during design but not previously provided to EPA, along with an analysis of whether the data confirm assumptions, recommendations, or conclusions made to date for the Puente Valley OU;
- (3) Assumed treatment plant influent quality over the design life of the treatment system, with a description of the methodology used to develop the estimate (including discussion of the likelihood and magnitude of short-term and long-term changes in influent concentrations);
- (4) An explanation of how Performance Criteria for the shallow zone will be met;
- (5) Discussion of any proposed or anticipated State or Federal drinking water or ambient water quality standards that would impact the design;
- (6) Filtration, disinfection, corrosion control, or other treatment requirements in addition to removal of site contaminants;
- (7) Assumed treatment technologies and/or treatment trains (for all media and byproducts) and initial treatment process flow diagrams;

- (8) Preliminary sizing of treatment system and other remedial action components;
- (9) Expected treatment facility removal capacity for all groundwater constituents requiring removal;
- (10) Delivery locations, rates, and pressures for the treated groundwater, and other conveyance system assumptions for supplying or discharging treated groundwater;
- (11) An assessment of the risk that insufficient recharge capacity may allow groundwater to leave the San Gabriel Valley Basin and payment of make up water may be required. Provisions for alternative use of treated groundwater should be discussed;
- (12) Interconnection requirements for delivery of treated groundwater, if any (e.g., connection to existing water distribution systems);
- (13) The degree of automation and planned level of operator oversight;
- (14) System control strategy, including the level of reliability, redundancy, or specific damage prevention features needed in each major component of the remedial action to respond to seismic events, power outages, equipment failure, system maintenance, operator error, or deviations from design assumptions;
- (15) Listing and discussion of the relative importance of siting criteria for new extraction wells, treatment facilities, pipelines, and other facilities, along with preliminary locations and alignments; and
- (16) Estimate of the distance from each proposed extraction location to the location assumed in computer model simulations completed in support of the Puente Valley OU containment remedial action and an evaluation of whether additional computer modeling activities are needed to verify the effectiveness of the actual extraction locations.

b. An Updated Construction Schedule for construction and implementation of the Remedial Action which identifies timing for initiation and completion of all critical path tasks; and

c. An updated list of permits, regulatory agency approvals, MOUs, access or use agreements, easements, and properties developed or acquired to date; copies of permits, approvals, and agreements not previously supplied to EPA; and activities and schedules for obtaining outstanding items required before start of construction (e.g., for use of existing facilities or disposition of the treated water).

d. Preliminary plans, specifications, and drawings, of groundwater extraction, treatment, conveyance, and monitoring systems;

e. Outline of required specifications;

f. An Updated Construction Schedule for construction and implementation of the Remedial Action which identifies timing for initiation and completion of all critical path tasks; and

g. An updated list of permits, regulatory agency approvals, MOUs, access or use agreements, easements, and properties developed or acquired to date; copies of permits, approvals, and agreements not previously supplied to EPA; and activities and schedules for obtaining outstanding items required before start of construction (e.g., for use of existing facilities or disposition of the treated water).

h. Sampling and Analysis Plan. In accordance with Section IX and XVI of the Order, and Section IV.M.1 of this SOW, the Respondent shall prepare a Sampling and Analysis Plan (SAP), or update an existing Plan to perform compliance monitoring and carry out any other field investigations needed to complete the remedial design, and construct and operate the remedial action. The Plan shall discuss the timing of data collection activities, including data collection activities needed to establish baseline conditions before startup of the remedial action.

## 2. Intermediate Design

The Respondent shall not be required to submit an Intermediate Design, but may seek EPA review of design concepts or documents if desired.

## 3. Prefinal/Final Design

The Respondent shall submit the Prefinal Design when the design effort is complete in accordance with the approved schedule. The Prefinal Design shall fully address all comments made on the Conceptual/Preliminary Design Report (and during the Intermediate Design review, if it occurs) and, if not previously addressed, be accompanied by a memorandum indicating how the comments were incorporated into the Prefinal Design. The Pre-Final Design submittal shall include, at a minimum, the following: (1) revised plans and specifications; (2) a draft Operation and Maintenance Manual; and (3) the Construction Quality Assurance Plan (CQAP). The CQAP shall describe the approach to quality assurance during construction activities at the PVOU and shall specify a quality assurance official (QA Official), independent of the construction contractor, to conduct a quality assurance program during the construction phase of the project.

The Prefinal Design documents shall be certified by a Professional Engineer registered in the State of California.

The Prefinal Design shall serve as the Final Design if EPA has no further comments and provides its approval. The Prefinal Design submittals shall include a capital and operation and maintenance cost estimate; reproducible drawings and specifications; and a complete set of construction drawings in full and one-half size reduction. The Final Design should also include a schedule for construction complete, and satisfaction of the "Operational and Functional" criteria.

The Respondent shall construct the shallow zone remedy on a design / build basis, and shall provide the prefinal and final design requirements in the Remedial Action Construction Complete Report. This approach and the requirements thereof shall be described in the RD / RA Work Plan.

#### G. Remedial Action

The Respondent shall implement the shallow zone Remedial Action. During the design period, in preparation for implementation of the Remedial Action and in accordance with the schedule included in Section V of this SOW, the Respondent shall submit a Construction Quality Assurance Plan, a Construction Health and Safety Plan, and any needed updates to the RD/RA Work Plan. The Construction Quality Assurance Plan must be reviewed and approved by EPA prior to the initiation of the Remedial Action.

Upon approval of the Final Design and Construction Quality Assurance Plan, the Respondent shall begin construction in accordance with the schedule in the RD/RA Work Plan. Significant field changes to the Remedial Action as set forth in the RD/RA Work Plan and Final Design shall not be undertaken without the approval of EPA. All work on the Remedial Action shall be documented in enough detail to produce as-built construction drawings after the Remedial Action is complete. Review and/or approval of submittals does not guarantee that the remedial action, when constructed, will meet the Performance Criteria.

##### 1. Remedial Action Work Plan

Respondents shall not be required to submit a separate Remedial Action Work Plan. Instead, Respondents shall provide supplemental information as necessary to update the RD/RA Work Plan.

##### 2. Preconstruction Meeting

A Preconstruction Meeting shall be held after selection of the construction contractor but before initiation of construction. The meeting shall include the Respondent's representatives and interested federal, state and local government

agency personnel; shall define the roles, relationships, and responsibilities of all parties; review work area security and safety protocols; review any access issues; review construction schedule; and review construction quality assurance procedures.

The Respondent shall ensure that the results of the Preconstruction Meetings are documented and transmitted to all parties in attendance, including the names of people in attendance, issues discussed, clarifications made, and instructions issued.

### 3. Remedial Action Construction

The Respondent shall implement the Remedial Action as detailed in the approved RD/RA Work Plan (as updated) and approved Final Design.

### 4. Prefinal Construction Inspection

Within fourteen (14) days after the Respondent believes that construction is complete and the remedial action, or a discrete portion of the remedial action, is operational and functional, the Respondent shall notify the U.S. EPA and the State for the purposes of conducting a prefinal inspection to be attended by EPA and the Respondent. Other participants shall include the Project Coordinator and other federal, state, and local agencies with a jurisdictional interest. If a Prefinal Construction Inspection is held for a portion of the remedial action, one or more additional inspections shall be conducted so that the entire remedial action is inspected.

The objective of the inspection(s) is to determine whether construction is complete and the remedial action (or the inspected portion) is “operational and functional.” Any outstanding construction items discovered during the inspection shall be identified and noted on a bullet list. The Respondent shall certify that the equipment is effectively meeting the purpose and intent of the specifications. Retesting shall be completed where deficiencies are revealed. A Prefinal Construction Inspection Report shall be submitted by the Respondent which outlines the outstanding construction items, actions required to resolve the items, completion date for the items, and an anticipated date for a Final Inspection. The Prefinal Construction Inspection Report can be in the form of a bullet list or letter.

### 5. Final Construction Inspection

Within fourteen (14) days after completion of any work identified in the prefinal inspection report, the Respondent shall notify the U.S. EPA and the State for the purposes of conducting a final inspection. The final inspection shall consist of a walk-through inspection by U.S. EPA and the Respondent. The prefinal

inspection report shall be used as a checklist with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

Any outstanding construction items discovered during the inspection still requiring correction shall be identified and noted on a punch list. If any items are still unresolved, the inspection shall be considered to be a Prefinal Construction Inspection requiring another Prefinal Construction Inspection Report and subsequent Final Construction Inspection.

#### **6. Remedial Action Construction Complete Report**

As specified in the approved schedule included in Section V of this SOW, after construction is completed on the entire remedial action and the systems are operational and functional as intended, the Respondent shall submit a Remedial Action Construction Complete Report. In the report, a registered Professional Engineer and the Respondents' Project Coordinator shall state that the construction of the Remedial Action has been completed in accordance with the RD/RA Work Plan submitted under this SOW. The written report shall provide a synopsis of the work defined in this SOW, describe deviations from the RD/RA Work Plan, include as-built drawings signed and stamped by a Professional Engineer, provide actual costs of the Remedial Action (and Operation and Maintenance to date), and provide a summary of the results of operational and performance monitoring completed to date. The report shall contain the following statement, signed by a responsible corporate official of the Respondent or the Respondent's Project Coordinator:

"To the best of our knowledge, after thorough investigation, we certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

#### **7. Interim Remedial Action Report**

As specified in the approved schedule included in Section V of this SOW, after the Respondent has determined that the Performance Criteria of the remedial action are being met, the Respondent shall submit an Interim Remedial Action Report. In the report, a registered Professional Engineer and the Respondents' Project Coordinator shall certify that the Remedial Action is operating and functioning as intended and that Performance Criteria listed in Section III of this SOW are being met. The written report shall provide a summary of the results of operational and performance monitoring completed to date and shall provide documentation to substantiate the Respondent's certification in full satisfaction with Sections VI, IX and XIV of the Order, including, but not limited to, relevant

data presented in accordance with Sections IV.K (Performance Evaluation Reports) and IV.L (Quarterly Compliance Monitoring Reports) of this SOW. The report shall contain the following statement, signed by a responsible corporate official of the Respondent or the Respondents' Project Coordinator:

"To the best of our knowledge, after thorough investigation, we certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

## H. Operations and Maintenance

Operation and Maintenance (O&M) shall be performed in accordance with the approved Operation and Maintenance Manual.

### 1. Operation and Maintenance Plan

The Respondent shall not be required to submit an Operation and Maintenance (O&M) Plan. O&M-related information shall be provided in the O&M Manual (see Section IV.H.2 of this SOW) and/or the Compliance Monitoring Plan (see Section IV.D of this SOW).

### 2. Operation and Maintenance Manual

The Respondent shall submit a draft Operation and Maintenance Manual during the design period in accordance with the approved schedule, and a revised draft after the final construction inspection to incorporate manufacturer / vendor information and any design modifications implemented during the Remedial Action. The Operation and Maintenance Manual must be reviewed and approved by EPA. The manual shall include all necessary Operation and Maintenance information for the operating personnel, and provide or address the following:

- a. System description;
- b. Startup and shutdown procedures;
- c. Criteria for determining when the remedial action is "operational and functional";
- d. Description and schedule of normal operation and maintenance tasks, including equipment and material requirements, anticipated equipment replacement for significant components, availability of spare parts, provisions for remote monitoring and control, operator training and certification requirements, staffing needs, and related requirements;
- e. Indicators of system performance and/or maintenance (e.g., parameters to be monitored to determine timing for activated carbon or ion exchange resin replacement, or to assess biological reactor performance);

- f. Criteria to be used to determine whether the treated groundwater will be supplied to the primary or secondary user or use;
- g. Any planned variation in groundwater extraction rate, including whether each extraction well is to be operated at constant or variable flow rate, and a description of the magnitude and timing of any expected variation;
- h. Record keeping and reporting requirements, including operating and inspection logs, maintenance records, and periodic reports; and
- i. Description and analysis of potential operating problems (e.g., equipment failure, higher than expected contaminant concentrations), including emergency operating and response activities and relevant health and safety information.

#### I. Monitoring Plan(s) for Other Potential Remedial Actions

If the Respondent propose to use passive remedial actions at certain locations, and these actions are shown to be capable of compliance with applicable Performance Criteria, then the Respondent must monitor these locations in accordance with an EPA-approved monitoring plan.

#### J. General Monitoring Plan

Monitoring activities for wells other than the compliance wells such as extraction wells, additional monitoring wells, and monitoring of the treatment system shall be performed in accordance with the approved General Monitoring Plan. The plan shall specify type, locations, frequencies, methods, and duration of monitoring activities. The Respondent shall submit the General Monitoring Plan no later than the date specified in the approved schedule. The General Monitoring Plan shall address the following requirements:

##### 1. Data Collection Parameters

A description of the types of data to be collected, sampling and data gathering methods, monitoring locations, sampling frequencies, and if appropriate, minimum monitoring duration.

##### 2. Well Discharge

The Respondent shall measure flow rates at each extraction well (and/or volumes of water extracted) as a function of time, using a meter/totalizer installed on the discharge pipe for each extraction well. The reading on the meter/totalizer shall be recorded at least quarterly and whenever water quality samples are collected from that well.

### 3. Treatment Plant Effluent / Treated Groundwater

The Respondent shall analyze treated water samples to verify attainment of groundwater treatment goals (i.e. at a minimum, MCLs, as stated in the discharge limits) and monitor operational parameters that are used as indicators of treatment facility performance or the need for maintenance. The Respondent shall propose appropriate parameters and schedules for sampling of treated groundwater to ensure compliance with ARARs. After a period of initial monitoring, the Respondent may propose criteria for subsequent reductions in sampling and/or analysis frequencies if the sampling results support such reductions.

### 4. Contaminant Mass Removal

The Respondent shall calculate the mass of individual contaminants removed from the aquifer by each extraction well each quarter, and cumulatively.

### 5. Aquifer Testing

The Respondent shall perform aquifer tests at new extraction wells to estimate aquifer transmissivity in the vicinity of the wells.

### 6. Air Emissions Monitoring

If applicable, the Respondent shall perform air emission monitoring to verify that air emissions from treatment operations do not exceed ARARs.

### 7. Data Analysis and Reporting

The General Monitoring Plan shall also describe how the performance data will be analyzed, interpreted, and reported to evaluate compliance with ARARs. All data shall be submitted by the deadlines specified in an agreed upon schedule. Claims of change, difference, or trend in water quality or other parameters (e.g., between observed values and an ARAR) shall include the use of appropriate statistical concepts and tests.

### 8. Split Sampling

The General Monitoring Plan shall also specify procedures for coordination of EPA or State collection of split or replicate samples.

### 9. Reporting Requirements for Data Collection to Support Compliance Monitoring Plan and General Monitoring Plan

The General Monitoring Plan shall provide a brief description of the contents and format for periodic Performance Evaluation Reports, including requirements from the Compliance Monitoring Plan.

Initially, at a minimum, individual contour maps shall be prepared indicating the extent of PCE and TCE contamination in the shallow zone, as well as mass removal. Assumptions made in averaging, excluding, truncating, or otherwise selecting or manipulating the data to be used in preparing the contour maps shall be clearly stated.

#### K. Performance Evaluation Reports

The Performance Evaluation Report shall be due to EPA every 6 months, and shall include summaries of compliance monitoring activities and groundwater data from the previous reporting periods (including summaries of Quarterly Compliance Monitoring Reports); updated water level contour maps showing measured water levels; field data to demonstrate hydraulic containment; interpreted water level contours; measured contaminant concentrations with contour maps; the interpreted extent of contamination; and appropriate groundwater modeling results required to demonstrate compliance with this SOW, including a detailed description and explanation of improvements made to the computer model of groundwater flow and contaminant migration in the preceding year and the resulting calibration; summaries of relevant operating and field data, including mass removal; any preliminary calculations and supporting data used to evaluate compliance; descriptions of the nature of, duration of, and response to any noncompliance; and any other requirements outlined in the General Monitoring Plan.

Initially, at a minimum, individual contaminant contour maps shall be prepared indicating the extent of PCE and TCE contamination in the shallow zone at the mouth of the valley. Contour maps shall also indicate mass removal. Additional contour maps shall be prepared if requested by EPA to indicate the extent of contamination of additional contaminants. Assumptions made in averaging, excluding, truncating, or otherwise selecting or manipulating the data to be used in preparing the contour maps shall be clearly stated. Performance Evaluation Reports shall be provided as described in Section V of this SOW.

#### L. Quarterly Compliance Monitoring Reports

The Quarterly Compliance Monitoring Reports shall include: measured contaminant concentrations at compliance wells; charts showing contaminant concentrations versus time at compliance wells; assessments and statements regarding whether Performance Criteria have been exceeded at compliance wells; predictions, if appropriate, of possible future occurrences of noncompliance; and relevant preliminary calculations and supporting data used to evaluate compliance; and any other relevant requirements outlined in the Compliance Monitoring Plan. Quarterly Compliance Monitoring Reports shall be due every three months, as described in Section V of this SOW.

## M. Supporting Plans

### 1. Sampling and Analysis Plan and Health and Safety Plan

**Sampling and Analysis Plan.** In accordance with Sections IX and XVI of the Order, the Respondent shall prepare a Sampling and Analysis Plan (SAP), or update an existing Plan to perform compliance monitoring and carry out any other field investigations needed to complete the remedial design, and construct and operate the remedial action. The Plan shall discuss the timing of data collection activities, including data collection activities needed to establish baseline conditions before startup of the remedial action.

The SAP shall include a Field Sampling and Analysis Plan (FSAP), a Quality Assurance Project Plan (QAPP), and a schedule for implementation of investigation, sampling, analysis, and reporting activities. The FSAP and QAPP may be submitted as one document or separately, and may reference an existing FSAP or QAPP. Upon EPA approval, the Respondent shall proceed to implement the sampling activities described in the SAP.

a. The FSAP shall describe sampling objectives, analytical parameters, sample locations and frequencies, sampling equipment and procedures, sample handling and analysis, management of investigation-derived wastes, and planned uses of the data. The FSAP shall be consistent with "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations" (EPA QA/R-5, November 1999), and "Guidance for the Data Quality Objectives Process" (EPA QA/G-4, September 1994). Document Control No. 9QA-06-89, April 1990, and other applicable guidance. It shall be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required. The FSAP shall include a schedule that describes activities that must be completed in advance of sampling, including acquisition of property, access agreements, and arrangements for disposal of investigation-derived waste.

b. The QAPP shall describe project objectives, organizational and functional activities, data quality objectives (DQOs), and quality assurance and quality control (QA/QC) protocols that shall be used to achieve the desired DQOs. The QAPP shall be consistent with "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations" (EPA QA/R-5, November 1999), and "Guidance for the Data Quality Objectives Process" (EPA QA/G-4, September 1994) and other applicable guidance (see list of references). The DQOs shall, at a minimum, reflect use of analytical methods for obtaining data of sufficient quality to meet National Contingency Plan requirements as identified at 40 CFR 300.435 (b). In addition, the QAPP shall address

personnel qualifications, sampling procedures, sample custody, analytical procedures, document control procedures, preservation of records (see Sections IX , XVI, and XXI of the Order), data reduction, data validation, data management, procedures that will be used to enter, store, correct, manipulate, and analyze data; protocols for transferring data to EPA in electronic format; and document management.

All analytical data, whether or not validated, shall be submitted to EPA within 45 calendar days of sample shipment to the laboratory or 10 days of receipt of analytical results from the laboratory, whichever occurs first. All analytical data, previously validated and in electronic format in an approved data structure, shall be submitted within 75 calendar days of the sample shipment to the laboratory. Well construction information shall be submitted at the completion of the initial sampling activities or within 90 days after completion of a well, whichever is earlier.

The Respondent shall demonstrate in advance and to EPA's satisfaction that each laboratory it may use is qualified to conduct the proposed work and meets the requirements specified in Section XVI of the Order. EPA may require that the Respondent submit detailed information to demonstrate that the laboratory is qualified to conduct the work, including information on personnel qualifications, equipment and material specification, and laboratory analyses of performance samples (blank and/or spike samples). In addition, EPA may require submittal of data packages equivalent to those generated by the EPA Contract Laboratory Program (CLP).

Health and Safety Plan. To ensure protection of on-site personnel and area residents from hazards posed by sampling activities, the Respondent shall also develop a Health and Safety Plan (or update an existing Plan). The Plan shall be in conformance with U.S. Occupational, Safety, and Health Administration (OSHA) requirements as outlined in 29 C.F.R. §§1910 and 1926, and any other applicable requirements. The Health and Safety Plan shall describe health and safety risks, employee training, monitoring and personal protective equipment, medical monitoring, levels of protection, safe work practices and safeguards, contingency and emergency planning, and provisions for site control. EPA will review but will neither approve nor disapprove the Respondent's Health and Safety Plan.

## 2. Construction Quality Assurance Plan

The Respondent shall develop and implement a Construction Quality Assurance Plan to ensure, with a reasonable degree of certainty, that the completed Remedial Action meets or exceeds all design criteria, plans and specifications, and Performance Standards. The Construction Quality Assurance Plan shall include the following elements:

- a. Responsibilities and authorities of all organizations and key personnel involved in the design and construction of the Remedial Action;
- b. A description of the quality control organization, including a chart showing lines of authority, members of the Quality Assurance team, their responsibilities and qualifications, and acknowledgment that the Quality Assurance team will implement the quality control system for all aspects of the work specified and shall report to the Respondent's Project Coordinator and EPA. Members of the Quality Assurance team shall have a good professional and ethical reputation, previous experience in the type of QA/QC activities to be implemented, and demonstrated capability to perform the required activities. They shall also be independent of the construction contractor;
- c. Description of the observations, inspections, and control testing that will be used to assure quality workmanship, verify compliance with the plans and specifications, or meet other QC objectives during implementation of the Remedial Action. This includes identification of sample size, sample locations, and sample collection or testing frequency; and acceptance and rejection criteria. The Plan shall specify laboratories to be used, and include information which certifies that personnel and laboratories performing the tests are qualified and the equipment and procedures to be used comply with applicable standards;
- d. Reporting procedures, frequency, and format for QA/QC activities. This shall include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records shall be presented in the Construction Quality Assurance Plan. The QA official shall report simultaneously to the Respondent's representative and to EPA; and
- e. A list of definable features of the work to be performed. A definable feature of work is a task which is separate and distinct from other tasks and has separate quality control requirements.

### 3. Construction Health and Safety Plan

The Respondent shall prepare a Construction Health and Safety Plan in compliance with OSHA regulations and protocols and other applicable requirements. The Construction Health and Safety Plan shall describe health and safety risks, employee training, monitoring and personal protective equipment, medical monitoring, individuals responsible in an emergency, and provisions for site control for workers and for visitors to the job site. EPA will review but

neither approve nor disapprove the Respondent's Construction Health and Safety Plan.

#### N. Work Complete Report

As Specified in the approved schedule included in Section V of this SOW, after all phases of the Work (including O&M) under the Order has been performed, the Respondent shall submit a Work Complete Report. In the report, a registered Professional Engineer and the Respondent's Project Coordinator shall state that the Work has been completed in full satisfaction of requirements of Sections VI and XIV of the Order. The written report shall provide a synopsis of the work defined in this SOW, describe deviations from the RD/RA Work Plan, provide actual costs of the Remedial Action (and Operation and Maintenance), and provide a summary of the results of operational and performance monitoring completed. The report shall contain the following statement, signed by a responsible corporate official of the Respondent or the Respondents' Project Coordinator:

"To the best of our knowledge, after thorough investigation, we certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

V Schedule for Major Deliverables and Other Tasks

ACTIVITY	DUE DATE
Effective Date of Unilateral Administrative Order	September 18, 2001
<b><u>PLANNING DOCUMENTS</u></b>	
Compliance and Sentinel Well Network Plan	Sixty (60) days after Order executed  If necessary, revised plan due fourteen (14) days after receipt of EPA comments
Compliance and Sentinel Well Installation Complete Report	Thirty (30) days after EPA approval of work performed under the approved Compliance and Sentinel Network Plan  If necessary, revised plan due fourteen (14) days after receipt of EPA comments
Submit Compliance Monitoring Plan	Sixty (60) days after EPA approval of Compliance and Sentinel Well Installation Complete Report  If necessary, revised plan due fourteen (14) days after receipt of EPA comments
Initial RD / RA Work Plan	Sixty (60) days after Order effective  Revised plan due fourteen (14) days after receipt of EPA comments
General Monitoring Plan	Thirty (30) days after receipt of EPA comments on Initial RD / RA Work Plan
Notification of the Name, Title, and Qualifications of Possible Construction Contractor(s)	Forty-five (45) days after EPA approval of Final Design

ACTIVITY	DUE DATE
<b><u>REMEDIAL DESIGN</u></b>	
Notification of Supervising Contractor (as required by Section IX of the Order)	Twenty-one (21) days after Effective Date of Order
Conceptual/Preliminary Remedial Design Submittal	Ninety (90) days after EPA approval of Initial RD/RA Work Plan
Prefinal Remedial Design Submittal	Sixty (60) days after EPA approval of Conceptual/Preliminary Design Submittal
Final Design Submittal (if needed)	Thirty (30) days after receipt of EPA comments on Prefinal Design Submittal
<b><u>REMEDIAL ACTION</u></b>	
RD/RA Work Plan Update	Sixty (60) days after completion of Conceptual/Preliminary Design
Notification of Selected Construction Contractor (if applicable)	Within five (5) days of selection
Pre-Construction Meeting and Construction Schedule with projections for "Operational and Functional"	Sixty (60) days after EPA approval of Final Design

<b>ACTIVITY</b>	<b>DUE DATE</b>
Complete Construction, and Satisfy "Operational and Functional" Criteria	Per EPA-Approved Construction Schedule
Initiate Construction	Fourteen (14) days after Pre-Construction Meeting and Approved Construction Schedule with projections for "Operational and Functional"
Prefinal Construction Inspection(s)	Fourteen (14) days after remedial action satisfies "Operational and Functional" criteria
Prefinal Construction Inspection Report(s)	Seven (7) days after Prefinal Construction Inspection
Final Construction Inspection(s)	Twenty-one (21) days after Prefinal Construction Inspection
Final Construction Inspection Report(s)	Seven (7) days after Final Inspection
Begin Continuous Operation	Fourteen (14) days after Final Inspection
Remedial Action Construction Complete Report	Draft due sixty (60) days after final construction inspection If needed, revised Report due 28 days after receipt of EPA comments
Interim Remedial Action Report	Draft due one hundred and eighty (180) days after EPA approval of the Final Construction Inspection Report or fourteen (14) days after the Respondent determines that Performance Criteria for the remedial action are being met, whichever is earlier.  If needed, revised report due twenty-eight (28) days after receipt of EPA comments

ACTIVITY	DUE DATE
<b><u>OPERATION AND MAINTENANCE</u></b>	
Operation and Maintenance Manual	<p>Shall be submitted as part of the Conceptual/Preliminary Design</p> <p>If requested by EPA, revised Manual due twenty-one (21) days after receipt of EPA comments</p> <p>Updated Manual due 14 days after Final Construction Inspection to Incorporate any design modifications made during the RA</p> <p>If requested by EPA, revised updated Manual due twenty-one (21) days after receipt of EPA comments</p>
<b><u>PERFORMANCE EVALUATION</u></b>	
Performance Evaluation Reports	Due every 6 months after approval of Compliance Monitoring Plan for first four years, and annually thereafter.
Quarterly Compliance Monitoring Reports	Due Quarterly, beginning ninety (90) days after EPA approval of Compliance Monitoring Plan
Noncompliance Notification	Due five (5) days after receipt of information indicating noncompliance, or potential noncompliance
Compliance Action Plan	Draft due fourteen (14) days after receipt of information indicating noncompliance
Compliance Correction Report	As established in approved Compliance Action Plan
Compliance and Sentinel Well Installation Complete Report	<p>Ninety (90) days after EPA approval of Compliance and Sentinel Well Network Plan</p> <p>If necessary, revised plan due fourteen (14) days after receipt of EPA comments</p>

ACTIVITY	DUE DATE
<b><u>SUPPORTING PLANS</u></b>	
Sampling and Analysis Plan	Shall be submitted as a part of the Conceptual/Preliminary Design
Site Health and Safety Plan	Shall be submitted as a part of the Conceptual/Preliminary Design
Construction Quality Assurance Plan, Construction Health and Safety Plan	Shall be submitted as a part of the Conceptual/Preliminary Design
<b><u>CERTIFICATIONS REQUIRED BY SECTION IX OF THE ORDER</u></b>	
Pre-Certification Inspection for Completion of the Work	Forty-Five (45) days after the Respondent concludes that all Work has been performed, including completion of all Operation and Maintenance activities
Certification Report Indicating that the Remedial Action has been Completed	Thirty (30) days after Pre-Certification Inspection
Certification Report Indicating that all Work has been Completed	Thirty (30) days after Respondent concludes that all Work has been performed, including completion of all Operation and Maintenance activities

## VI References

The following list, although not comprehensive, provides citations for many of the regulations and guidance documents that apply to the RD/RA process. Respondent shall review these guidance documents and shall use the information provided therein in performing the RD/RA and preparing all deliverables under this SOW.

"National Oil and Hazardous Substances Pollution Contingency Plan, Final Rule," 40 C.F.R. Part 300

"Superfund Remedial Design/ Remedial Action Handbook," U.S. EPA, Office of Emergency and Remedial Response, June 1995 (EPA 540/R-95/059)

"Interim Final Guidance on Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties," U.S. EPA, Office of Emergency and Remedial Response, February 14, 1990, OSWER Directive No. 9355.5-01.

"EPA NEIC Policies and Procedures Manual," U.S. EPA, May 1978, revised May 1986.

"Guidance for the Data Quality Objectives Process" U.S. EPA, (EPA QA/G-4).

"EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations," May 1994, U.S. EPA, (EPA QA/R-5).

"Guidance for Quality Assurance Project Plans," February 1998, U.S. EPA, (EPA QA/G-5).

"Preparation of a USEPA Region 9 Field Sampling Plan for Private and State-Lead Superfund Projects," April 1990, U.S. EPA, (No. 9QA-06-89).

"Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites," U.S. EPA, Office of Emergency and Remedial Response, (Draft), OSWER Directive No. 9283.1-2.

"Methods for Monitoring Pump-and-Treat Performance," U.S. EPA, Office of Research and Development, June 1994 (EPA 600/R-94/123).